American Journal of Public Health
*and* THE NATION'S HEALTH

Volume 33 April, 1943 Number 4

# The Army's Contribution to Industrial Hygiene*

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WHEN warfare became mechanized and large numbers of soldiers were enrolled in what is termed "The Armored Forces," industrial hygiene came to the Army—Military occupational hygiene.

The mechanization of warfare brought to the soldier, in addition to hazards of combat, certain health hazards which formerly were associated with various types of industry—hazards of fumes, gases, and dust, hazards of maintenance and repair with their job as soldiers in the Armored Forces. Associated with these considerations are those resulting from military activities all over the world necessitating detailed studies of proper rations and proper clothing, and the important matter of water consumption. From the need to know all that could be ascertained about these important items, there was born the Armored Force Medical Research Laboratory at Fort Knox devoted to maintaining and increasing the physical efficiency of the soldiers in the Armored Forces—especially the tank crews. This is one of the most important phases of the application of industrial hygiene in the Army.

Physiologists, physicists, pathologists, ventilation experts, chemists, biochemists, nutrition experts are determining what must be done to protect the health of the soldier in a mechanized war, fought under all varieties of climate. The soldier in many phases of Army life is of necessity a skilled craftsman—a highly trained mechanic. The Armored Force trains thousands of young men in many branches of mechanics, including communications, and in so doing is making a tremendous contribution to the welfare of the nation.

It is the aim of the Army that these men learn their respective skills under the most favorable conditions, and are protected from health hazards both while learning and practising their jobs.

The Army employs not only soldiers but industrial workers, and is now probably the largest employer of labor in the country. The Army owns and

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 27, 1942.

operates more than 160 industrial plants, and owns more than 250 industrial plants which are operated under contract. These plants embrace every phase of the manufacture of the munitions of war, explosives and related chemical industries, and the maintenance and repair of mechanized equipment and aircraft. These industrial establishments include many whose employees number ten to twenty and thirty thousand industrial workers, an ever increasing number of whom are women. In all, as nearly as can be ascertained under conditions of rapid expansion, more than 600,000 men and women work in these plants.

Out of the needs created by this situation there was established in the Division of Preventive Medicine in the Surgeon General's Office, an Occupational Hygiene Branch. The functions of this branch are to satisfy the responsibilities of the Army, in its rôle as an employer, to its employees. In this respect the Army is in the same position as any other employer. Working conditions must be safe, unavoidable health hazards must be controlled, environmental sanitation must be enforced, and adequate medical service, of the type that has become standardized in well run American industrial establishments, must be maintained.

In order to fulfil these functions two main activities have been undertaken:

1. Wherever indicated, industrial physicians with the necessary training and experience, have been commissioned in the Medical Corps and assigned to the Army-operated plants. Acknowledgement is here made to the medical directors of American industry whose coöperation has made this course of action possible. Industrial physicians have also been assigned as industrial medical officers to the service commands. Industrial hygiene engineers have been commissioned in the sanitary corps and have also been assigned to Service Commands and to those establishments where they are needed.

2. There has been established an industrial hygiene laboratory, located in the School of Hygiene and Public Health of Johns Hopkins University. The main function of this laboratory is to study environmental conditions in Army-operated plants, make special inquiries, and elaborate methods of controlling health hazards. Nothing is static. New inventions, new war agents, new manufacturing processes are the order of the day, all bringing their own peculiar problems of health and safety.

In supervising health conditions in the Army-owned, contractor-operated plants, the Surgeon General's Office is most fortunate in having the assistance of the Division of Industrial Hygiene of the U. S. Public Health Service with their vast experience in this field. The medical departments of these contractor-operated plants are not staffed with military personnel but are employees of the company physicians and their assistants. The aid of the Public Health Service makes it possible to carry on a complete program.

The Occupational Hygiene Branch maintains an active liaison with the various Army Departments, particularly the Ordnance Department, the Chemical Warfare Service, and the Air Force, who contribute their technical knowledge and experience to the health problems, often complex, which are encountered.

The progress of industrial medicine and industrial hygiene in this country in the past 25 years has been continuous and has reached a high point of efficiency. It is the aim of the Army to provide the benefits of this progress to both soldiers and civilian employees, as well as to contribute to it out of its own experience.

# Industrial Hygiene Program of the U. S. Navy*

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THE rôle that our government expects all industrial physicians and hygienists to play in the war effort is to institute measures to promote and maintain the health, well-being, and morale of civilians. Such measures should be applied to all classes of population but especially to the industrial workers whose working efficiency is of especial importance.

With industrial establishments being rapidly expanded, and new plants being constructed we will need more and more workmen. Minors, women, retired employees, and workers with physical defects which disqualify them for military service are making our industrial health problems more acute. These groups will have to adjust themselves to more strenuous tasks, more concentrated efforts, and probably longer hours than those to which they have been accustomed. The health of these employees is of paramount importance. The government is depending upon you to institute measures now to prevent any shortage of plant man power due to preventable illness or injury.

It has come to our attention recently that the employees of a certain firm suggested that rest periods and lunch period be discontinued. They offered to eat lunch while continuing at work. Obviously such a scheme would not be conducive to maximum production. Another plant has permitted apprentices to work 7 days every week in order to shorten the duration of the apprenticeship period. A 7 day work-week is undesirable, regardless of age, is injurious to health, and a threat to the youth of the country.

If we could have assurance that our war effort would be successful in a matter of a few months we could speed up production by long days and weeks and probably get away with it. On the other hand, since we do not know how long we will be in this state, we should eliminate the temporary sprinting and buckle down for a long distance run with our speed regulated to meet the situation.

The Council on Industrial Health of the American Medical Association some time ago prepared an outline as a guide for those interested in industrial medical relationships and the objectives aptly stated were:

1. Prevention of disease or injury by establishing proper medical supervision over in-

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dustrial materials, processes, environments and workers.

2. Health conservation of workers through physical supervision and education.

3. Medical and surgical care to restore health and earning capacity as promptly as possible following industrial accident or disease.

In recognition of its responsibility for the maintenance of the health of its industrial employees, the Navy for many years has had an active safety program at its numerous shore establishments. In addition to industrial accident prevention it has recognized that the basic principle of health promotion was eminently worthy of consideration. Because of the enormous expansion in naval construction additional problems and exaggeration of old ones had to be coped with. So two years ago the Navy began to enlarge its industrial health program from the nucleus of its existing organization.

We all realize the decisive part industry must play in the present war and that victory will ultimately depend upon surpassing the enemy in producing ships, planes, munitions, and supplies of all kinds with which to support the armed forces.

Adverse working conditions result in industrial absenteeism, and surely this loss of time cripples defense. Efficiency and maintenance of health cannot be divorced. Today industrial efficiency must be measured in terms of military gain or loss. Recently one of the navy yards launched a fine, new capital ship built without a single fatality. That represents a military victory.

## ORGANIZATION

### *1. Section of Industrial Health*

The Navy proceeds with the belief that dangerous material can be handled safely and that any mechanical job can be performed safely if proper study is given in advance and the necessary precautions are observed.

Early in 1941 a new Section of Industrial Health under the Division of Preventive Medicine was set up in the Bureau of Medicine and Surgery. The medical officer in charge of this section has been formally trained in industrial hygiene and the fundamentals of safety engineering and also possesses a degree in public health. This section coöperates with the Shore Establishments Division of the Navy Department to conserve the health and prevent disease and injury in Navy industry. It operates in the major areas of industrial hygiene by the establishment of proper control over the industrial environment in navy shore establishments; by analyzing occupational disability reports and making recommendations to the field in regard to detection and elimination of potentially hazardous working conditions; by preparing information on various hazardous materials and processes; and by coördinating the efforts of the industrial hygiene field personnel.

### *2. The Field Organization*

Over 50 navy medical officers have completed postgraduate instruction in industrial hygiene and many more have developed varying degrees of proficiency through personal experience in the navy industrial shore establishments. Such medical officers have been assigned to navy industrial shore establishments to be in charge of distinct units of industrial hygiene under the Senior Medical Officer. The majority of these officers are putting full time on industrial health work and coöperating with the station safety officer so as to provide and promote an adequate safety and health program.

Each principal industrial station has assigned in addition, one or more officers who are graduates of schools of chemical engineering, sanitary engineering, mechanical engineering or chemistry, and trained in industrial hygiene. These officers are equipped with neces-

sary laboratory and field equipment to help the medical officer in handling problems of dust, fumes, illumination, noise, ventilation, etc.

The functions of the medical officer for industrial hygiene, and those of the safety officer are separate, though closely correlated. The former includes the study of the natural health hazards of occupational activities, the conduct of the necessary technical surveys to determine potential or existing exposures, and the laboratory analyses to evaluate these exposures. These observations and recommendations are made available to the safety officer who is responsible for the application of the necessary corrective measures.

In summary the functions of the medical officer for industrial hygiene are:

a. To study the occupational health problem.
b. To determine the toxicological data in terms of their effect on workers.
c. To conduct surveys of potential health hazards in specific activities and processes.
d. To collect samples in the field pertaining to occupational health exposures.
e. To make laboratory analyses both on samples taken in the field and on any material submitted with reference to the causation of occupational disease.
f. To prepare reports of findings, recommendations and conclusions evaluating the hazard of occupational health conditions.

*3. Shore Establishments*

The Navy Department Safety Engineer serves as adviser to the Director of the Division of Shore Establishments. This division is under the central administration of the Assistant Secretary of the Navy. The division develops the standards for safety protective equipment used by the navy stations and is responsible for the development of the general safety rules for shore establishments of the Navy. By frequent field surveys the Navy Department engineers, through the Director of the Division of Shore Establishments, serve in a technical advisory capacity to the field in problems of safety engineering.

At each establishment a naval line officer, designated as the safety officer is responsible for the administration of the accident prevention program. He may be assisted by a junior line officer, a civilian assistant engineer, and one or more civilian safety inspectors. In general, one safety officer, engineer, or inspector is available for each 1,500 employees, which is in addition to shop safety inspectors assigned to specific shops.

The duties of the safety officer include: thorough inspections and general surveys of all mechanical conditions of the working places; the addition of necessary appliances for the protection of employees; and the investigation of all accidents in order to devise means for preventing a recurrence. All improvements come under his supervision. There must exist close coöperation between the safety officer and the Medical Department so as to correlate all phases of the safety problem.

THE INDUSTRIAL HEALTH PROGRAM

The object of the Navy's industrial health program is to protect the health, safety, earning power, and efficiency of the worker, and promote maximum production by minimizing the occurrence of occupational diseases, needless exposure to death or disabling injury, and absenteeism from whatever cause.

All prospective employees are given a complete physical examination by a member of the Navy Medical Corps to determine their physical condition and fitness for duty. The results of such examinations are of great value in proper placement so that the new employee will not constitute an accident risk to himself or others. Frequently correctible defects and incipient disease are discovered and the man is strongly encouraged to consult his family doctor for appropriate treatment. Following

the preëmployment examination the prospective employee is told of the importance of reporting to the dispensary for proper care of all minor injuries and the ground work is started in regard to creating interest in safety.

All industrial employees in whom physical defects may endanger the health of themselves and/or others and who are subject to any occupational disease exposure, are given physical examinations at intervals sufficient to insure that necessary precautions are taken to maintain and improve their health and efficiency.

Operators of cranes, locomotives, engines, and other similar work, are given complete physical examinations yearly. Employees with an exposure to silica dust receive a chest x-ray every 6 months. Handlers of radium or radioactive luminous compounds receive a complete physical examination, including analysis of breath for radon, twice a year. Workers cutting or welding painted or coated materials and spraying lead pigmented paint receive a basophilic aggregation test quarterly where proper engineering control is considered in effect. The medical officer and the safety officer collaborate in determining sources of occupational disease exposure at each station, necessitating a periodical physical examination.

First aid boxes are not allowed in shops or offices because experience has shown that employees improperly take care of minor injuries and in many cases serious infection develops which results in loss of time and possible permanent disabilities. Every employee who is sick or injured must report to a first aid station, sub-dispensary, or main dispensary for treatment or advice.

A large factor of medical importance that affects the well-being and therefore the efficiency of workers is the relation of the worker to his environment. Because of the difficulty in obtaining certain strategic materials there is a continuous search for substitutes, and the Medical Department must stay on guard to anticipate and control possible hazards from new processes and new materials.

It is necessary that the medical officer know what potentially harmful substances, conditions, or forms of energy are being used, to what degree and the length of exposure in case of each individual or group before such harmful contaminants can be controlled.

Analyses to determine the presence and quantity of fumes, gases, and chemicals, and the sound application of hygiene, sanitation, and accident prevention, with periodical physical examinations are essential to the general plan of providing a safe and desirable working environment.

An industrial hygiene laboratory, adequately equipped is available at each of the Navy's principal industrial establishments, insuring facilities for the study of potential health hazards and for checking the effectiveness of existing control measures.

Other matters of paramount interest to the medical officer are: illumination, noise, fatigue, personal hygiene facilities, and the daily and weekly hours of work.

### REPORTING OF OCCUPATIONAL DISABILITIES

It is obvious that adequate reporting and recording is required to keep industrial disabilities to the minimum and to serve as legal documents for the adjudication of compensation claims since the civil employee has both a moral and legal right to expect his government to maintain adequate permanent records to establish his right to compensation, and the tax payer has an equal right to permanent records to protect him against fraudulent claims for compensation against the government.

The Chief of the Bureau of Medicine and Surgery was directed by the Secre-

tary of the Navy to require a report of all accidents, injuries, and industrial illness occurring to Civil Service personnel employed by the Navy Department. This report covers both "lost-time" and "no-lost-time" injuries. In addition to sociological and medical data the basic reports serve to develop accident cause information. Close coördination and cooperation of the Medical Department with designated shop supervisors and safety officers is mandatory in order to attain accuracy of reporting. A responsibility of the shop supervisor is to furnish the accident cause information, thereby necessitating him to be familiar with the accidents occurring in his department. The original copy of each occupational disability report is mailed to the Bureau of Medicine and Surgery within, but not later than, 48 hours of the time of occurrence. In the Division of Preventive Medicine punch cards are cut from these reports and statistical analyses are prepared which serve as an index to control measures necessary. From these analyses have come many advances in guarding machinery, protection against fumes from chemical processes necessary in the manufacture of munitions, control of the dust menace to health, etc.

## CONCLUSION

The Navy's existing industrial hygiene program is paying dividends in decreasing lost time due to illness, decreasing the incidence of accidents, decreasing compensation payments, increasing production and efficiency, and promoting and maintaining morale of employees. It is recognized that there can be no relaxation of effort and to maintain efficient production there must be continuous active attention to prevent labor wastage.

The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

# Industrial Hygiene Activities in the Public Health Service*

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INDUSTRIAL health is a "prime contractor" in this nation's war. Today when every disabled war worker means less planes, ships, tanks, and guns, the national industrial hygiene program assumes an A-1 priority rating. The program which was put into effect 18 months before Pearl Harbor has felt increasingly the impact of war. Basic activities have progressed smoothly and with gathering momentum. Recent developments, however, deserve special mention since they demonstrate a closer integration of industrial hygiene with the war effort. There has been, too, a growing recognition of the "essentiality" of industrial health protection on the part of war agencies and civilian groups.

The current program of industrial hygiene in the Public Health Service follows the lines recommended by the Subcommittee on Industrial Health and Medicine of the Committee on Health and Medical Care in 1940, but has been greatly expanded during the war months. The program includes recruitment and training of industrial hygiene personnel, research, aid to state and local industrial hygiene services, special services for the War Department, and a promotion of coördinated health and medical services for the industrial population.

During the past year the number of trained professional personnel employed in federal, state, and local services has increased to 500. There are now 38 state industrial hygiene organizations, 1 county unit, 3 city units, and 2 district units covering a large city and several adjoining counties. The majority of the personnel now employed in these units has been recruited and trained by the Public Health Service and detailed to duty in state and local industrial hygiene units.

The activities of the governmental industrial hygiene units have increased greatly during the past ten months. The expansion of the war industries since Pearl Harbor has been phenomenal. The number of workers engaged in war production had doubled in September, 1942, at which time 15 million were employed in war industries as compared to 7 million in December, 1941. It is estimated that, by 1943, the total will be 17½ million. For the past two years, the work of governmental industrial hygiene services has been directed almost exclusively to the improvement of conditions in industries engaged in the production of war materials. Hence, the wartime increase in workers to be served has severely taxed the staffs and facilities of the existing units. Preliminary analysis of reports to the Division of Industrial Hygiene

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 27, 1942.

indicates that, in the fiscal year 1942, 32 state and local units reached some 5,000 establishments employing 2,400,000 workers.

In the immediate future and for the duration, the pressure upon the existing industrial hygiene facilities will obviously increase. The extent to which state and local units will be able to meet the demands depends very largely upon the ability of the Division of Industrial Hygiene to augment its funds and its program of recruitment, training, and assignment of professional personnel for war duty in these units.

Despite the fact that may staffs have been over-burdened, available industrial hygiene services have not yet been put to the maximum use. In many instances, serious problems have not been brought to the attention of state units. In other cases, units have not streamlined their procedure in order to speed up the correction of hazards in war industries. Time is the most "critical" material in total war. We should now give attention to ways of utilizing existing industrial hygiene services to the fullest degree and more efficiently. Certainly, there is ample opportunity to develop short-cuts in peacetime procedures, which will not lower essential standards of good industrial hygiene practice.

The Division of Industrial Hygiene also has been carrying on a coöperative program with the War Department for the protection of the health of workers in government-owned establishments. Approximately 150 have been certified to the division for thorough investigation. To accomplish this task, the division maintains mobile units, each consisting of 4 professional personnel, and the necessary supporting personnel at its laboratories. The mobile units have already completed surveys and made recommendations concerning the improvement of working conditions in 65 plants. Construction of many plants is yet to be completed. If the Division of Industrial Hygiene is to speed further investigation and follow-up, it will be necessary to add more mobile units.

A committee to consider optimum hours of work has been formed by representatives of the Labor Department, the War and Navy Departments, the War Production Board, the Maritime Commission, the Department of Commerce, and the Public Health Service. After examining all available evidence, including studies made by experts and the practical experience of management and labor, the committee has made recommendations for the guidance of war contract plants as well as governmental establishments in establishing a schedule of hours of work best adapted to particular enterprises.

The Division of Industrial Hygiene is working with the Office of Civilian Defense to develop blackout procedures in factories and in effecting organization to deal with enemy attack on industrial centers.

A survey of the dispensaries and hygiene services in federal departments in Washington, D. C., was conducted by the division last spring. It was found that these dispensaries for the most part were established and administered by the departments and bureaus concerned, and that functions and activities varied widely. Of 85 dispensaries employing 155 nurses, not more than 20 were under the supervision of a physician. In no government agency was there found a comprehensive program of environmental and personal hygiene and preventive medicine such as is recommended for private industry. The over-all recommendations of the survey called for improvement in organization, personnel, utilization of space, and equipment in these dispensaries, with the provision that all should be operated under medical supervision. Since the completion of the survey, a number of fed-

eral agencies have adopted the recommendations and have sought the consultant assistance of the Public Health Service in the establishment of adequate industrial hygiene and medical services for federal employees.

In the field of research, much of the work of the Division of Industrial Hygiene is conducted for the Army and the Navy. The confidential nature of this work precludes reporting as to the specific projects and as to the results so far obtained. In general, however, these researches are concerned with numerous problems of aviation medicine and with the toxicology of explosives.

Investigation of occupational dermatoses has engaged much of the division's attention as a result of the use in war industries, of many new substances and processes. Intensive training of specialists in dermatology in occupational dermatoses was initiated during the past few months. A group of dermatologists from all parts of the country were invited to attend a brief training course at the National Institute of Health. These specialists have constituted themselves consultants on occupational dermatology in their communities, and their services are available upon request of industrial physicians in war industries.

Other new consultant services in the division have been established. Dr. S. J. Seeger, Chairman of the Council on Industrial Health of the American Medical Association, has been appointed consultant to the Division of Industrial Hygiene, for the purpose of securing closer coöperation between governmental industrial hygiene services and medical societies. A dental officer of the Public Health Service has been assigned to the division as dental consultant. He has been active in promoting the extension of dental services in industry through state and local health departments which already have dental hygiene programs. The objective is to include dental examinations in preëmployment and periodic health examinations; to coördinate the work of state dental directors and industrial hygiene directors; and to set up demonstration dental services in selected plants.

At the request of several important industries, ventilation studies are under way for the control of benzol and other toxic solvents now being substituted in many industries for toluene. Safe utilization of these potentially dangerous substances will be increasingly required as toluene becomes less and less available.

Progress has been made in collecting and compiling data on medical service facilities in plants representing all types of industry and three size classifications.

The Division of Industrial Hygiene has been active in stimulating the x-ray examination for tuberculosis of the workers in many war areas. In cooperation with the Office of Tuberculosis Control of the States Relations Division of the Public Health Service and the various state industrial hygiene divisions, a study of several types of x-ray technics for the diagnosis of tuberculosis and silicosis has been made. Mobile 35 mm. photofluorographic units are operating in several areas at the present time.

The medical history of World War I shows that mortality rates for tuberculosis increased greatly during the war years and for some years thereafter, especially in Europe. Today, the massing of armed forces for training purposes and the concentration of families and industrial workers in defense and cantonment areas, often under unhygienic conditions, becomes a hazard in controlling the spread of tuberculosis. Unless national efforts are directed toward combating specific factors in the tuberculosis problem, we may well expect an upward trend in the tuberculosis mortality curve for the

United States. Such an upward trend has already taken place in England.

The armed forces have already undertaken the examination of all enlisted men entering the Services. The next specific undertaking should be the examination of all industrial employees and an annual follow-up in certain groups.

The nation-wide survey of the duties of nurses in industry undertaken by the American Public Health Association in coöperation with the National Institute of Health has been completed. A preliminary report will be presented to this conference. The professions as well as administrators and health agencies will benefit greatly by the findings of the survey which has covered approximately one-third of the nation's industrial nursing force.

The Division of Industrial Hygiene has been active in the preparation and dissemination of information for professional personnel, for management and labor, and for individual workers. Reports of scientific investigations and statistical studies have been published and distributed widely. A monthly news letter reaches nearly 1,000 industrial hygienists.

In addition an outline of an industrial hygiene program in individual plants has been prepared and made available to labor-management committees of war production plants and other interested groups. This outline was prepared in skeleton form and mimeographed. It met with an unexpectedly large demand, some 5,000 copies have been distributed, and requests for several thousand more have come in.

A manual on engineering control of environmental hazards and a manual on medical service in industry have been prepared, both of which have been incorporated in the loose-leaf safety manual issued by the Plant Security Division of the Office of Ordnance, U. S. War Department.

A plan for preparation of a handbook for physicians on industrial hygiene has been approved by the Federal Security Administrator and the Surgeon General. The manual is being prepared by the professional staff of the Division of Industrial Hygiene under the editorship of Dr. Gafafer, and will discuss the outstanding problems of health conservation in the war industries.

Considerable progress has been made on an annotated bibliography on industrial psychiatry to be compiled under the joint sponsorship of the Health and Medical Committee, the National Research Council, and the National Institute of Health. It will be issued in a series of six or more bulletins. The title selected is "Mental and Emotional Hazards in Industry—A Field Bibliography for Industrial Psychiatry."

Two other publications are in production at present—the first an illustrated pamphlet interpreting to management, labor unions, and other interested groups the usual services of a state or local industrial hygiene unit, and the second an illustrated catalogue of industrial hygiene educational materials available from the Public Health Service.

To inform the professional groups further, throughout the country, governmental industrial hygiene services, state medical societies, and educational institutions have sponsored institutes for private physicians, nurses, and other professional groups. The Division of Industrial Hygiene has participated in many of these intensive training programs and will continue to do so.

I have briefly summarized activities now going forward in the combined effort of the civilian authorities for industrial health. Much still remains to be done. As I see it, the problem is not so much what to do but how to do it.

Since the development of industrial

health service is a relatively new field in public health, it is important that the objectives, functions, and achievements of industrial hygiene be interpreted to management, labor, and to the individual worker. The promotional program should be strengthened and extended to recruit the support not only of the professions, but also of the particular groups whom modern industrial hygiene would serve.

The problem of medical care for workers and their families is one of vital importance. Reports to the U. S. Public Health Service indicate that in many communities there are not available sufficient medical, dental, and nursing personnel, or hospital facilities, for the medical care of workers and their families. This problem arises not only from the rapid development of industries in the sparsely populated areas, but also from the shortage of professional personnel as the result of supplying the needs of the Army and Navy.

Nine in every 10 industrial absences because of disability are the result of diseases and accidents incurred off the job. A few progressive employers and unions have developed comprehensive medical services for workers and their families. On the whole, however, plant medical services and union health programs have not broadened their scope to include general medical care. In hard-pressed industrial communities, where no other facilities are available, industrial medical services should be extended to general medical care both for employees and their families. Since the shortage of physicians available for full-time industrial service impedes the expansion of in-plant programs, the practising physicians of war communities should be utilized to the utmost by industry. In fact, the industrial medical service, whether rendered by full-time professional personnel or not, should be closely coördinated with all the public health, hospital, and medical facilities of the community.

If existing industrial medical services are strengthened and retained, approximately one-third of our workers will have available such services in their plants. The remaining two-thirds of our workers who are employed in small plants of less than 500 are at present virtually without needed industrial or medical health service. Appropriate action should be taken to meet these needs, and compulsion used if necessary to secure medical service in war contract plants. The British experience indicates that this can be done, given a proper assignment of medical personnel and a national policy.

The existing standards for employment of handicapped workers should be reviewed and adjusted to present needs. Among the several million handicapped persons in the United States there are many thousands who should be employed in war plants. The Division of Industrial Hygiene has joined with the U. S. Employment Service in a series of conferences to consider the employment of physically handicapped persons in the war industries. The policy recommended to the War Manpower Commission would require the employment of many thousands of persons with minor or major disabilities and would make the preemployment physical examination an effective tool for the proper placement of all workers.

One of our major problems is that of community resources. Despite the expansion of public health services, many industrial communities are still providing meager public health, medical, and hospital services. The problem is especially acute in communities where large war plants have been constructed almost overnight and where tens of thousands of industrial workers have taken residence. Problems of over-

crowding, lack of sanitary facilities, and communicable disease control have arisen. The provision of adequate sanitary and public health services is primarily a local problem. Nevertheless, when local inertia retards the war effort, state and federal agencies have a clear responsibility to act.

It is an old public health maxim to strike hard where you can do the most good—that is, to center activities where the burdens of disability and premature death are heaviest and the opportunities for health conservation are greatest. Today, in this nation at war, the focal point is the industrial population—the men and women engaged directly or indirectly in producing or transporting the things we need to win.

For the past 25 years, study after study has been made and consistently demonstrated the fact that death and disability rates are higher among the industrial population than among any other employed groups. During the same period, industrial hygiene, modern medicine, and the generalized public health program have proved beyond the shadow of a doubt that an astonishing proportion of this human waste can be prevented, at less cost than that of continued neglect.

At this critical time in our nation's history, it is imperative that all of us—individually and collectively—put that knowledge to the proof. The governmental industrial hygiene services—federal, state and local—are ready and willing to bring to bear upon the health problems of workers the full force of their preventive programs. It remains for them to redouble their efforts, both to extend the preventive program and to recruit the support of all available resources for adequate health care of America's workers upon whom—shoulder to shoulder with the armed forces—rests our fate and that of our children.

# Unexpected Occupational Disease Exposures During Wartime*

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THE subject assigned provides an opportunity to discuss what we think is the proper attitude of industry toward the health, safety, and comfort of its workers. In the Chrysler Corporation we hold firmly to the conviction that healthy workers are a valuable aid to production. We believe that the health of employees can and should be conserved, and that industrial health hazards can be anticipated and remedial measures prepared before practical exposure occurs.

Therefore, a complete industrial health program contemplates not only the treatment of disease but also the prevention of disease, and, since the prevention of disease requires the recognition of new hazards before they become operative, it may be open to question whether any occupational diseases should be unexpected. There are a number of materials which are new to industry and there are a larger number which have new applications. We presume that all of the elements have been discovered and a small amount is known about all of them. However, some of the rarer substances such as indium, gallium and osmium are now coming into wider use due to priority restrictions on older and more common materials. Also, some new organic compounds are in use and possibly other new organic compounds will be introduced from time to time. By far the larger category consists of materials which have been known for a long time but which are now employed in new ways, although many old materials are new and unfamiliar to some industries.

## GENERAL PAPER

In the following interesting cases which have come to our attention, it should be understood that we do not have the ideal solutions for every one of the problems found.

In the past, benzene has been restricted within the Chrysler Corporation so that we have had none of this material in our plants. Recently benzene was found in a new operation involving the polishing of reflectors where it was used as a flotation agent for the polishing material. Production people in charge, never having had any experience with benzene, were surprised to know that it was a toxic substance. A few trial runs indicated that a solvent naphtha, such as a hydrogenated naphtha, would take care of this problem satisfactorily. Because the hydrogenated naphthas are only slightly toxic, any possibility of major hazard is removed from this operation by its use. Since this problem has arisen, members of the Industrial Hygiene Division of the Medical Department have been able to make other suggestions which

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 27, 1942.

materially improve the polishing properties of the compound used. This exemplifies the production gains which may be brought about through the investigation of hazardous materials.

Another compound which was not previously used by our Corporation, except for fire fighting fluids, is carbon tetrachloride. This material had been needed for a great number of purposes in the past but substitutes have been provided which are satisfactory in every way. Recently a survey of one of our gun plants indicated that a fairly large quantity of carbon tetrachloride was being employed on one operation. Investigation showed that a certain critical tapping and machining operation was using up to 25 per cent carbon tetrachloride along with a cutting compound in order to provide a technically satisfactory product within the very close tolerances demanded by the inspectors. Numerous cutting compounds had been tried and none had proved to be satisfactory. Tests on the operation showed that this condition was very unsatisfactory from the health standpoint in that serious illness might result among the workmen if corrections were not made. However, this work was so essential that, had a change been made in the operation, without a satisfactory substitute being provided, it is highly possible that the production operation would have ceased. Since this was undesirable, it was then suggested that small percentages of trichlorethylene might work satisfactorily from a technical standpoint. Test trials revealed that very small percentages of trichlorethylene would do as good a job as larger percentages of the more dangerous carbon tetrachloride. The operation is now using a maximum of 8 per cent trichlorethylene, and better production results are being obtained than when carbon tetrachloride in larger percentages was being used. The tests made with the interferometer have shown concentrations which should cause no concern.

Certain other suggestions have been made relative to substitutes which will relieve all toxicity fears, should these substitutes prove to be technically good compounds. However, trichlorethylene is a satisfactory technical product and, since the toxic concentrations do not exceed 120 p.p.m., at any time and under any condition, it is doubtful whether further tests to introduce new substitutes will be useful. Trichlorethylene has shown some interesting properties in connection with cutting compounds and may prove to be valuable on other jobs.

The above mentioned materials certainly are not new and they probably would not be interesting except that the applications were not common and certainly were unusual to us. They are examples of old materials becoming important through new uses.

Lead tetraethyl, a compound which is used to increase the octane rating of motor fuel, is an example of a well known material which again is coming into more prominence due to the war requirements for higher octane aviation gasoline. Whereas in the past we had been accustomed to using a white gasoline with no lead in it and had received satisfactory performance because the octane rating of this white gasoline was sufficiently high to be technically satisfactory, we now find lead tetraethyl being used not only in the higher aviation grade gasoline but also in the lower grades of gasoline. This comes about because the various white gasolines are being "bumped up" to higher octane ratings. Thus the gasoline which you are buying at the corner gas station is now composed of a gasoline which has a much lower octane rating and additional amounts of lead tetraethyl. Indeed, some gasolines which previously have advertised their non-lead content now contain lead tetraethyl.

This becomes important because these gasolines are used throughout the plants for various washing purposes. Men get their hands, and sometimes other portions of their body, in it and lead absorption through the skin must receive our consideration. In this particular case, the correctional efforts involved an educational campaign among the workers and a change in our specifications. First, warning signs and placards were placed at all points where gasoline was dispensed for any purpose, which stated among other things that this leaded gasoline should not be used for any purpose other than for motor fuel. Suitable mineral spirit, mineral seal oil, or various grades of naphtha were then specified and used for all washing and cleaning purposes. In a few instances, other measures such as the installation of automatic degreasers or alkali washers were necessary.

A control problem is, however, introduced into those plants which are in multi-story buildings due to the fact that concentrations of lead higher than the maximum allowable may be introduced on elevators and in other inadequately ventilated closed spaces where jitney trucks and other motors may be running. These areas must be tested periodically. Other areas where high leaded gasolines are known to be used in tanks, airplane motors, and trucks must be studied to determine what additional control measures, such as increased ventilation, will be needed. Indeed, in some places, increased specific and general ventilation has already been provided.

Another example of an entirely new hazard is now mentioned. Several cases of dermatitis and conjunctivitis have been found in a new secret adhesive operation. It has been ascertained that the cement is the causative factor. However, due to the secret nature of the process and material, it is difficult to get accurate information on all its components, and such information will have to be determined in the laboratory. Patch testing will be utilized to ascertain whether or not certain components in question are the source of the dermatitis and suggestions for possible substitutes will then be made. This may involve new organic materials or old ones which have not been previously studied. It is probable that substances which have not been fully investigated from the toxicity standpoint will be encountered in this particular instance.

It may be interesting to mention now a group of instances relating to dermatitis which have been of interest to us recently. In one case, a canvas tarpaulin material received from one company was used and no difficulty noted. However, the same material, with presumably the identical type of resin and dye impregnation, supplied by a different vendor, gave cause for complaint. Workmen got dye and resin into their skin and a very mild dermatitis resulted. In addition it was almost impossible for the employees to wash the dye from their hands and arms. Investigation revealed that the company supplying the material complained of indicated that the difficulty arose from the combination of the dye and the resin in the tarpaulin. Further, wartime needs caused the material to be shipped as soon as it was manufactured, with no proper period of time for aging. In addition, a new solvent was being used due to priority restrictions on the solvent which had previously been approved. In this case, inquiry directed to the company resulted in an admission that the above was true and that other similar inquiries had been received from a midwestern state health department. The material which was being received by our Corporation in a tacky wet state was immediately improved and new formula for the treatment of the canvas cloth was put into use by this company causing it to be entirely satisfactory.

Another situation in which a number of women were complaining of itching but of no severe dermatitis was found in a wiring department on airplane parts. Here the resin used in the wire coating did have some irritant properties though not enough irritation resulted to cause skin lesions. Chemical tests indicated the presence of cresol-like compounds. The skin might become slightly reddened but the main damage came from the scratching which resulted from the irritation. Because of this, the companies concerned in supplying this material were asked to deliver their products in a dryer and less tacky state. It was found that the resins which were used in the coating were not dried out sufficiently and the residual vapors were sufficient to cause irritation. Very definite relief was provided for the persons concerned by washing their bodies with sodium bicarbonate solution.

Another group of men working on bronze gun parts complained of an itching sensation and presented eczematous skin lesions. These lesions we have called "bronze itch" which is characteristically very much like what is listed in the literature as "copper itch." The condition predominated about the neck line, belt line, legs, ankles, and wrists, which indicated very definitely that it was a mechanical irritation. Patch and chemical tests were performed which bore out this conclusion. The remedy in this case consisted of personal cleanliness. A program of personal hygiene instituted immediately brought very great relief and this was supplemented by the introduction of a personal protective coating. Since these measures were taken, no further complaints have been received.

Another case analogous to this but having much more interesting possibilities was found in the airplane body work where aluminum chips and dust were getting into the men's clothes and over all parts of the body. The lesions caused were apparently of two types but both were signified by the resultant pigmentation of the skin which lasted for a considerable period of time. It is possible that this pigmentation may result from the small percentage of magnesium which is found in this aluminum alloy. There is, however, the complication that this may be effected by irritants in the electrical wiring coatings mentioned before. In this instance, the maximum number of cases, as was the case with the "bronze itch," arose during warm weather. A program of personal hygiene immediately eliminated most of these cases but a few persisted which were characterized by an itching sensation and small hard papules which, on healing, were pigmented for a considerable period of time.

An entirely different kind of exposure has developed with the increase of horse power of airplane motors. While the testing of motors has always been a noisy operation, these operations had in the past been kept to a 90 decibel level or lower. However, the advent of engines of from 1,500 to 2,000 h. p. and upward has resulted in test rooms having noise levels of from 120 to a peak of 140 decibels even though scientific methods of sound-deadening rooms have been followed. In one instance, a test room having a noise level of 118 to 120 decibels had the control chamber, where all the operators are located, in a separate acoustically treated room, but even in this room the noise level was approximately 90 decibels. A suggested solution was the installation of sound-deadening baffles about the pipes and motor on a hinged arrangement so that ready access could be had to all parts of the equipment. Such devices can result in a lowering of the noise level from 12 to 20 decibels. Such reductions do not appear to be large but, when the very high level of sound is considered, this is a worth while reduction particularly when the nature of the scale used in deter-

mining the decibels is considered. A reduction of 2 decibels in these high ranges means the cutting of the volume of sound in half. Whereas a few years ago a noise level of 110 to 115 decibels was considered about the top, we are now faced with routine noise levels which are considerably higher. Somewhere around 125 decibels the problem becomes more involved than simply the loss of hearing. In fact, the hearing may be safeguarded through the use of personal protective devices but little is known concerning the vibrational effects on other parts of the human organisms at these higher levels of sound. All the men exposed to high levels of sound are now given special physical examinations which include, in addition to audiometer tests, complete clinical laboratory tests, basal metabolism, and electrocardiography. Close control maintained at frequent intervals on the individuals concerned should lead to the detection of injury before any becomes serious.

While the noise problem is not new, it was not fully anticipated that the noise levels would reach those mentioned above but, in view of the attempts to make louder and louder sounds for air raid sirens, it may be expected that still higher levels of sound will be found in special instances, and these higher levels presumably could cause some systemic damage unless guarded against. This, as far as we can see, will open an entirely new field of research in a field that is very old.

The mere increase in plant facility has introduced additional problems in all parts of the country. While new sanitation and housing loads have had recognition from the appropriate public health agencies, there have been problems introduced into the plants themselves.

Thus, when one new plant was built for government use by our Corporation, wells had to be drilled, the resultant water tested, and sanitary facilities provided. It so happened that the water contained such large amounts of methane that, when a match was applied to a milk bottle full of freshly drawn water, the gases bubbling from the water would ignite and a blue flame would be maintained on top of the water for almost a minute. This gaseous content led to various explosive possibilities which were not wholly solved until a new source of water supply was brought into the plant. The appearance of this amount of gas also indicated the need for very thorough chemical and bacteriological examination of the water supply. In addition to the water supply, a small sewage treatment plant had to be provided. This plant, though modern in every respect, did give off some slight objectionable odors but this was not important as it was located a considerable distance from any plant activity. Recent plant expansions have brought the plant operations right to the doors of this sewage disposal unit, and some complaints have been made. This has resulted in the installation of a ventilation system over the exits to the sludge pits so that all odors were removed.

Probably the most unexpected occupational disease exposures have arisen as the result of the stringencies of the raw materials used in the war effort. In a War Production Board release of August 24, 1942, the following materials were listed in Class III as available in significant quantities as substitutes for scarcer materials: ferroboron, ferromanganese, gold, indium, lead, osmium, palladium, and sodium. When the large number of metals available are considered, this very small list, which includes a large proportion of formerly rare and expensive elements, is indeed unexpected. Of these elements and compounds, something is known concerning gold, lead, and sodium; a little less is known of ferroboron, ferromanganese and palladium; and very little is known concerning the acute and chronic toxici-

ties of indium and osmium. Some investigations have been instituted on indium within the Chrysler Medical Department. Reports will be made as phases of the investigation are completed. These substances and compounds mentioned above are important in view of the fact that these are the materials that the authorized agencies state are available for substitution. Already indium is used in the surface treating of airplane engine bearings, and a considerable number of other uses are projected.

The determination of the hazards which might result from the use of these materials in numerous new applications assumes great importance in order that the health of the working population may be fully protected.

# Impact of War on Children and Youth—Intensification of Emotional Problems*

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THE nations of the world that recognize and protect rights of the individual have been deeply concerned about the relationship between war and juvenile delinquency, not only since this war began but during and after the first world war. This concern is indicative of the present-day constructive attitude toward delinquency in children—namely, that the delinquent child is a sick child.

If I may extend this concept I would describe juvenile delinquency as a symptom of nutritional deficiency, a deficiency in the child's spiritual nutrition resulting in a stunting of ideals and a crippling of character, so that the child cannot administer his behavior to conform to the standards of the community.

Scientific observation suggests that the ability of a person to direct his behavior into satisfying and acceptable channels is dependent upon a complicated balance between gratification and renunciation.

Let us briefly view the mechanics of this. The child's first gratifications and restrictions are controlled by the parents, chiefly the mother at first. Later, the father, and then others in the family, school, and community become involved in this give and take of human relationship with the child. With growth come new and different gratifications and required renunciations, but none of these ever assume the basic importance of those that belong to the family. The child must in early months accept many restrictions and deprivations. He must be taught to accept conformity which requires renunciation of doing what he pleases, when, where, and to whom. He can accept this personal sacrifice and discipline only when he is assured of parental love in its place. He gradually accepts as his own the moral concepts that are taught him by the parent whom he loves. This is as it should be.

But why is the delinquent child different? In the majority of instances he is different because he has different feelings—he has not learned to love and admire anyone sufficiently to deny himself certain pleasures for the purpose of winning their love and approval. He sees himself as unloved and unaccepted by one or both parents. Any additional deprivation imposed by the limitations of family, community or state reinforce his feeling of unjust discrimination. Lacking an acceptable, strong, emotional tie which would form a basis for personification of ethical concepts, he develops a distorted conscience and weakened powers of resistance. All this makes him susceptible to any stimulating adventure within his reach that offers escape from the hurt of loss of love and pride. In return for security and adequacy within the family he attempts to settle for the security of the gang, the

* Presented at a session of the U. S. Children's Bureau, Commission on Children in Wartime, at the White House, Washington, D. C., February 4, 1943.

thrill of independence, and denial of dependence. His total behavior may be considered an expression of protest against keenly felt deprivation.

If we are to consider intelligently the problem of juvenile delinquency, whether in time of peace or war, we must examine the way in which the fundamental needs of all children are met, and must accept the importance of the fact that what needs are not met by the family unit must be met by the larger family—society. Let us see what happens to the child's fundamental needs in wartime.

Will he as an infant and small child get less mothering and less fathering in wartime with all that is involved in affectional relationship, physical care, personality development, and moral guidance? Will he be robbed of even the security of familiar surroundings because his family migrates? The small child robbed of the spiritual values of home is surrounded on all sides by the permissiveness of violence at an age when he needs so much mature help in controlling his own destructive drives. The young child is normally aggressive and destructive. Education in our culture is concerned with directing this drive into constructive channels. With war and his identification with warriors, the inhibition and sublimation of destructive drives becomes more difficult for him. The child will not receive the same assurance from the adult in wartime that killing and mass violence is wrong and that problems can be solved in other ways. For all these reasons young children need mothering more than ever before. They also need the presence of a father or father person, around whom to build their ideal of a good man.

School children need vastly more personal security and guidance. The school must feel greater responsibility for the child's life over and beyond the narrow limitations of a standard curriculum. Curricula should be geared to modern living, with emphasis upon social studies and individual responsibility in community, state, and world affairs. Children today are seriously handicapped in their opportunity to believe in the inherent goodness of man and must be helped to understand the experiences that engender love and hate in all men. The church can contribute immeasurably to morale and character building for all children, providing the church, like other institutions, secures personnel of the stature for such responsibility. Ideals are molded by the patterns of personalities we admire. The child cannot build an ideal for himself unless he has the semblance of that pattern in the home, school, community, or church.

The adolescent with his approaching intellectual maturity but characteristic emotional instability reacts more noticeably to war than does the younger child. His basic personality and character potentialities are in a process of flux and are experiencing added physiological pressures. Most of his attitudes and behavior trends are well formed by now, but a testing out is required before final decisions are made and before a philosophy of life becomes more or less crystallized. War is contrary to all he has believed in or planned for. He does not have as yet the mature resignation to tolerate too much frustration, and war presents so many renunciations over and above the possibilities for gratification. Now at a time when he is struggling for mastery over his body and soul, he is bombarded with the haunting insistence to live—live fully and dangerously if necessary, for tomorrow may be too late. The physiological functioning of the adolescent demands activity. Inactivity bores him and creates internal tension which must find release. He is likely to resent the authority of any who would deny him freedom. The conflict between dependence upon the family and independence

normally reaches acute intensity at this period. With war challenging the productive abilities of all, most young adolescents are impatient to prove their personal worth. They want to work, whether in a war activity or at part-time work nonessential to the war. This is in part their protest against society considering them as children. The sudden assumption of mature responsibilities and privileges without the experience and training belonging to maturity can place young people in a social situation fraught with many dangers.

Yes, children of all ages will be subjected during the war to more of the experiences that make for delinquency than ever before. War intensifies many times the normal needs of all children. Does it not logically follow that whatever we do for the welfare of all children will be reflected in a lower incidence of delinquency? We trust that the majority of older children of today will be immune to the destructive influence and increased opportunities for delinquency growing out of war. But what of those children who are unstable —whose earlier experience has been lacking in character-building essentials? Just as the malnourished child has greater susceptibility to acute and chronic infections, so the neglected, unloved, and untaught child has less resistance to the forces that endanger character. This is the child who will become delinquent with the increased opportunity and who should receive special consideration. No community can ever completely make up to these children for their early deprivations. Few communities will be able to do more than partially meet their accumulated and intensified needs. Facing the prognostic limitations growing out of the very nature of character formation and the nonavailability of skills for use in redirecting character trends, we should immediately focus our attention upon the safeguards and protection that the community can offer the youth who has not internalized the required restrictions in his own concept of behavior.

Protection needs to be particularly strengthened in the areas in which young people work and play. Experience should advise us that youthful discontents are selective in the activities they choose for expressing their unsatisfied hopes and desires. If we attempt to substitute one type of activity for another we should be guided by the interests and background of the particular group to be served.

The importance of leadership—dynamic leadership — acceptable to adventurous youth cannot be overstressed. Adolescent boys must have male leadership.

In conclusion, I want to express the belief that we are justified in our concern about juvenile delinquency. I say this not only in the interest of those boys and girls who will become delinquent during this war, but in behalf of all those who are now children and who will carry the responsibility of world peace and brotherhood into the future.

# Trends in Laboratory Procedures in the Milk Control Program of St. Louis*

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ST. LOUIS, while operating under the standard milk ordinance, presents a special problem to the laboratory on account of two facts: the number of producers is relatively enormous (*e.g.*, 20 times as many as those supplying San Francisco, of roughly the same population); and all milk marketed is pasteurized. The reasons for these facts are historical. The early city officials concentrated on moving the producers, as public nuisances, outside the city limits and then found themselves unable to claim any control over them. As the number of one and two cow producers among the neighboring farms and the size of the milkshed increased, pasteurization became an economic necessity to the city processing plants, especially in the hot season. While the number of shippers has declined in recent years, it is still over 4,000.

The peculiarities of the local situation have naturally colored the viewpoint of the laboratory. In addition to the routine problems, we are especially interested in discussing methods for examining large numbers of raw milks and for the phosphatase test.

The large number of producers is an excellent argument for the use of the simplest laboratory control procedures authorized for individual shipper samples, but we are convinced that the methylene blue reductase test is the most valuable single test for such samples. Various workers have attempted to increase the refinement of this test by technical changes which increased its reproducibility (with regard to duplicating results on identical samples), but markedly altered the numerical values obtained.[1] Thornton[2] has pointed out that, without an absolute standard by which we can evaluate true accuracy, we should hesitate to sacrifice either the convenience or the significance, based on years of accumulated experience, of the old and simple version. Obviously, one sure way to increase the ability of the test to reflect fairly the quality of a given supply is to examine a larger number of samples from each source; and by working rather to simplify than to complicate technic, we can increase the number of samples that can be tested in a given period with a given laboratory staff. With this object we have adopted the following simplified procedure, which in no way changes the essentials of the present standard test[3]:

The samples arrive in the laboratory packed in ice water, and are left there until a large number, or the bulk of those expected, have come in; but we keep as far as possible within the statutory 2 hours. A pipetting machine, such as is used in serological labora-

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 30, 1942.

tories, is filled with methylene blue solution after rinsing with chlorine solution, hot tap water, and sterile distilled water. The stoppers are removed from the tubes and the dye pipetted into the milk. The tubes, which are in racks holding 10, are stoppered with a strip of smooth-surfaced sponge rubber, long enough to cover the rack, held in a metal gripper. This is held so tightly against the mouths of the tubes that they may be inverted and shaken vigorously without leakage. As one rubber grid is used for shaking, an assistant rinses a second in running tap water and blots it with a fresh paper towel. The tubes are checked with their log and placed in a large water bath without further delay. The incubation and reading are conducted as usual.

In this fashion, two people can set up 1,500 or more tests in about an hour; the schedule works out so that the time spent in checking the tests into the bath is the same as the time taken for reading, so incubation periods can be exactly measured. The labor is virtually reduced to preparing the outfits for collection, taking the samples, and reading. The only deviations from the Standard Methods procedure [3] are thus:

*Use of pipetting machine*—This is calibrated to deliver far more accurately than can the human worker under pressure. The cleaning process is so effectual that the dye as pipetted contains less than 1 bacterium per ml.

*Leaving samples uncovered during incubation*—Since they are kept in a covered water bath, air contamination is insignificant. Diffusion of oxygen into the milk is known to be too slow under these conditions for the absence of a stopper to have any effect on the reduction time. The rubber strip adds few or no organisms.

*Mixing of the tubes at room temperature instead of at 37° C.*—This permits the schedule to be maintained and, since the tubes are warmed very shortly after mixing, should not affect the creaming.[3]

Some 40,000 samples are tested each year. Improvement in quality of the unprocessed milk is shown by the fact that only half as many samples are now reduced in less than 6 hours as in 1938.

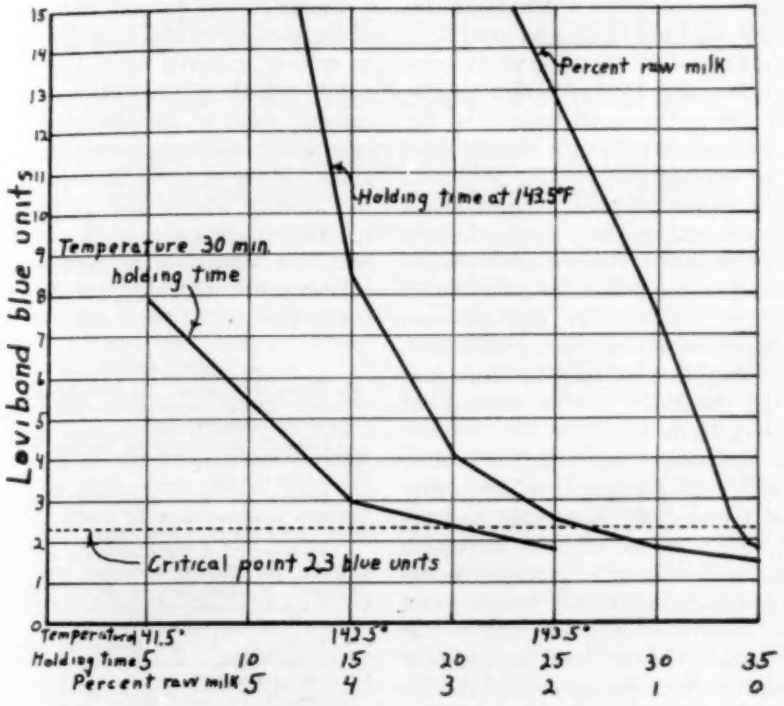
As the methylene blue test has become our mainstay for testing raw milk, so has the phosphatase test for pasteurized milk. Extensive studies conducted here in 1937 showed that the Scharer [4] field test (which did not then include solvent-extraction), with 1 hour incubation, and the original quantitative Kay-Graham,[5] with 17 hour incubation, were equally sensitive in detecting experimental underpasteurization (as defined by local ordinance), or contamination with raw milk. After several months in which both were used, the short test was adopted as an exclusion test, and the Kay-Graham method retained only as a check on positive samples. Now all pasteurized products submitted for plate count are tested, the sample for the phosphatase test being pipetted immediately after that for the plate count, with the same pipette. Positive or suspicious samples are repeated in duplicate, with the prescribed controls, by the quantitative Kay-Graham method, and the results are reported in Lovibond blue units. The Milk Control Section, which receives the reports, has been supplied with a graph, based on the results of the experimental studies, on which blue units are plotted against holding time, temperature, and raw milk content (Figure 1). The section reports that it finds this graph very useful in tracing the source of violations.

In the last 5 years we have run 4,000 to 6,000 phosphatase tests a year. The percentage of positive reactions has dropped from 2.2 for milk and 4.3 for cream, to 0.3 and 0.8 respectively. Frankly raw milks are virtually not seen. It is obvious that even before the

FIGURE 1

PHOSPHATASE TEST

*Correlation of underpasteurization and percentage raw milk in terms of Lovibond blue units using our modified test*


Lovibond blue units
Percent raw milk
Holding time at 143.5°F
Temperature 30 min. holding time
Critical point 2.3 blue units
Temperature 141.5° 143.5° 143.5°
Holding time 5 10 15 20 25 30 35
Percent raw milk 5 4 3 2 1 0

introduction of the test, a remarkably good job of pasteurization was being done by the industry; now it is close to perfect.

Because of the requirements of the ordinance, we continue to make thousands of plate counts. We have only one or two comments on technic: we incubate plates only at 37° C., since 32° incubation in this climate would be expensive for the small dairy laboratories. We have modified the rules[3, 6] for counting plates to this extent: when our routine dilutions of 1:100 and 1:1,000 fail to produce plates within the 30–300 range, counts are reported literally as found, on the argument that below 30 the error is in the direction of making the count too high, and to report the result merely as under 3,000 has the force of making it still higher; and conversely, when the 1:1,000 plate is over 300, the error tends to make the count appear lower than the actual, so less injustice is done by giving the found value than by reducing it to the blanket minimum of 300,000. As the counts are to be averaged with others, this seems the fairest procedure.

We have been subjected to an increasing demand for miscellaneous services beyond the strictly sanitary and nutritive control of milk; determinations of curd tension and efficiency of homogenization, diagnosis of mastitis, detection of plant contamination with thermophilic, thermoduric, and ropy-milk organisms, even surveys of local dairy

laboratories as to compliance with Standard Methods. Perhaps it should be pointed out that the laboratory service operates as an independent unit of the health division, not as a milk laboratory *per se*, and is able to exercise a certain amount of discretion as to function, attempting to stay rather strictly within the public health aspects of the job (we have for example decided that it is not our province to trace producers contributing thermophilic or thermoduric organisms; and we test for mastitis only with reluctance). We are consequently interested in the policies of other health department laboratories and welcome this opportunity to acquire information, in the meantime relying for our clues on the emphasis in the manual of Standard Methods.

To summarize, our situation is this: the milk supply comes from frequently tested sources and is entirely pasteurized; there is an efficient inspection service, especially as to post-pasteurization processes; a virtually tamper-proof bottle closure is required; and in the phosphatase test we have an excellent laboratory check on pasteurization. We feel that where this situation exists, a shift in emphasis in laboratory control should be very seriously considered. It is probably generally agreed among laboratory workers that bacterial counts (by whatever method) contribute little or nothing to controlling such a supply, and indeed at times actually detract from the control because of the logical absurdities encountered in the attempt to enforce bacterial standards. This is not to belittle the evolutionary or educational value of the procedure, but to emphasize its fundamental inappropriateness in the situation described. Rice[7] has already voiced our obligation to reëxamine critically such procedures with the object of eliminating what have become, with the passage of time, irrelevancies.

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# Prognosis in White and Colored Tuberculous Children According to Initial Chest X-ray Findings*

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THIS paper is concerned with the extent of chest lesion demonstrated at initial x-ray examination in a group of 1,148 tuberculous children whose infection was discovered prior to 15 years of age, and who have been followed for varying periods of time in a study of their mortality from tuberculosis. The data were taken from an outpatient clinic for tuberculous children conducted at the Johns Hopkins Hospital since 1928. This clinic admits tuberculin-positive infants under 2 years of age and keeps them under observation as long as possible. It also arranges for the examination of parents and older siblings in the appropriate public dispensaries of the same hospital, and thus maintains a family record which it attempts to keep up-to-date both for morbidity and mortality from tuberculosis. The records for analysis include those of infected children admitted to the special clinic during infancy, and also those of infected older siblings examined in the general pediatric dispensary. Infection was determined in the children of these families by their reaction to intradermal testing with old tuberculin. All their x-rays have been reviewed by the author.

The races are somewhat unequally represented, there being 404 white and 744 colored children in the study. In both races about 60 per cent of the children whose records were analyzed were under 5 years of age at the time infection was discovered; something less than 30 per cent fell into the age group 5 to 9, and not much over 10 per cent fell into the age group 10 to 14. This concentration in the younger age groups is a reflection of the requirement that all the families followed must contain an infant under 2 years of age, eligible for care in the special clinic. There was no evidence of sex selection.

Roughly, one-fifth of the children of this study were brought to the dispensary because of some complaint, and tuberculous infection or disease came to light in the course of a complete examination which included the tuberculin test. The remaining four-fifths were examined only because of known tuberculosis in the family, usually an open case in an adult. Verification of household contact with open tuberculosis was somewhat less frequent for infected colored infants than for white children of the same age, and exposure from the community at large appeared to account for infection in a somewhat larger proportion of Negro infants. So far as *duration* of household contact could be estimated, colored children of this study

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had less exposure than white children; but this does not dispose of the possibility that colored children when in contact may have been more intensely exposed.

For both races the families studied belonged to economic groups unable to pay for medical care; and for the period of observation covered by this report the great majority were supported by public relief. Homes were overcrowded and far from ideal for both races; and while the average Negro families probably lived under even poorer conditions than the average white families, at this economic level the differences in environment were not striking.

The great majority of these children had only dispensary supervision during the most active phase of their tuberculous infection. This was especially true for children found infected before 6 years of age for whom the State of Maryland had made no routine provision in state sanatoria during the period covered by the study. A small number of white infants could be accommodated without expense at a private sanatorium; and both white and colored infants were occasionally admitted to the pediatric services of general hospitals, though not infrequently when already ill with tuberculous meningitis or miliary tuberculosis.

### DETERMINATION OF TUBERCULOUS INFECTION

All the children included in this analysis were considered to be infected with tuberculosis. The presence of infection was determined in most instances by the child's reaction to old tuberculin applied intradermally and read 48 to 72 hours later. A positive reaction was defined as one with at least a full centimeter of edema, erythema alone not being considered a definitely positive reaction.

Table 1 shows the various test doses of tuberculin and the number of children reacting to each dose at the time their initial x-ray was taken. It will be seen at once that there were 14 children either not tested or failing to return for readings, leaving 1,134 for whom a test and its result were recorded. Of these there were 7 for whom a negative reaction was noted, while the remaining 1,127 gave typically positive reactions.

Unfortunately, no consistent effort

TABLE 1

*Number of Children Tested with Various Dosages of Old Tuberculin and Their Reaction at the Time of Initial Chest X-ray*

| *Reaction to Old Tuberculin* | *White* | *Colored* | *Total* |
|---|---|---|---|
| Positive to 0.01 mg. | 36 | 101 | 137 |
| Positive to 0.1 mg. | 295 | 484 | 779 |
| Total reacting to 0.1 mg. or less | 331 | 585 | 916 |
| Positive to 1.0 mg. | 69 | 141 | 210 |
| Positive to more than 1.0 mg. | ... | 1 | 1 |
| Total reacting to 1.0 mg. or more | 69 | 142 | 211 |
| Total Positive Reactions | ... | ... | 1,127 |
| Negative to 0.1 mg. (Not tested further) | 1 | 5 | 6 |
| Negative to more than 1.0 mg. | ... | 1 | 1 |
| Total Negative Reactions | 1 | 6 | 7 |
| No tuberculin reading recorded | 3 | 11 | 14 |
| Total Children Tested | ... | ... | 1,134 |

was made to discover the smallest test dose of tuberculin necessary to produce a positive reaction; and accordingly this study can throw no light on the relationship between allergy level and extent of lesion. In 916, or 80.8 per cent, of the 1,134 tested, a reaction was obtained with 0.1 mg. or less of tuberculin; in 210, or 18.5 per cent, 1.0 mg. of tuberculin was used as a test dose when infection was discovered. Not infrequently 1.0 mg. was employed unnecessarily when the interval had been rather long since the latest negative result with that dosage.

Table 1 indicates a colored child reacting positively to a dose larger than 1.0 mg. of tuberculin. The test dose in this case was 2.0 mg., and it was applied to a year old infant with a chronic cough who was repeatedly negative to smaller doses. This child had five older siblings all of whom had become definitely positive to 0.1 mg. of tuberculin during association with fatal tuberculosis in the father, whose death took place before the infant in question was born. Later this patient coughed up half a peanut, his rather dubious x-ray findings cleared completely, and allergy could never be demonstrated at ordinary levels. In the light of observations such as those made by Furcelow, *et al.*,[1] who observed a high proportion of pseudo-reactions even among children requiring 1.0 mg. tests, it is possible that this child was never truly infected with tuberculosis. This is the only instance in the study where the author thinks infection is somewhat doubtful.

There are 6 children shown in Table 1 who gave negative reactions to 0.1 mg. and were not tested further. One was a white child of 11 years of age whose initial film showed a typically calcified primary complex. Of the 5 colored children in this category, 2 were less than 1 year and 2 years old, respectively, and both were suffering with acute miliary tuberculosis when brought to the dispensary. Death occurred within a few days. Three others whose ages in two instances were 8 years and in the third 10 years, all showed well calcified nodes at the hilum in their initial chest films.

The colored child classified in Table 1 as negative to doses of tuberculin larger than 1.0 mg. is of special interest. She was 2½ years old when an extensive pneumonia of the left lung was discovered which showed no change in appearance and no indication of resolution during a hospital admission lasting nearly 5 months. During this interval repeated tuberculin testing was done, and the dosage increased to 10.0 mg. with only negative response. Repeated efforts to recover acidfast bacilli from the sputum and gastric contents failed. There had been known contact with sputum-positive tuberculosis in an adult member of her family for several weeks prior to the discovery of her lung condition. Another bout of exposure took place between her discharge at 2 years and 11 months, and her readmission at 3 years and 3 months, for pertussis and supposed pertussis pneumonia. On the second admission it became quite clear that a generalized tuberculosis was present, and this was proved at autopsy one month later. During the last month of her life small doses of tuberculin had been applied but not increased beyond 0.1 mg. and she was so acutely ill that her failure to react was not surprising. At autopsy a bilateral and very extensive tuberculous involvement of the tracheobronchial lymp nodes was found and blocks of tissue from the chronic pneumonia of the left lung revealed tuberculosis. It seems likely that from the age of 2½ years she had suffered from pulmonary tuberculosis, in spite of lack of allergy, and therefore she is included in this study from that age.

In addition to the children just described whose tuberculosis was considered to be established in the absence of a positive tuberculin reaction, there were

14 others included in Table 1 for whom no tuberculin test was recorded. Three were white children giving a history of contact with tuberculosis and ranging in age from 9 to 12 years. All 3 displayed calcification at the lung root, typical of old mediastinal tuberculosis. There were 11 untested colored children. Four of these were examined because of contact and showed calcification at the mediastinum; their ages were from 7 years to 12 years. The remaining 7 colored children all presented evidence of manifest tuberculosis on their first visit and all of them proved to be fatal cases: one, a boy of 14 years of age, was ill with advanced reinfection tuberculosis and lived only 3 days; the others were instances of fatal primary disease: a child of 6 years who lived nearly a year, and 5 others, all of them under 3 years of age and surviving from a few days to several months.

The foregoing discussion is an attempt to show that in the 21 instances where children have been included in this analysis without a positive tuberculin, the initial x-ray evidence of calcification of tracheobronchial lymph nodes, or of extensive pulmonary disease leading to an early death from tuberculosis, has been considered adequate evidence that the child was tuberculous at first observation.

### INITIAL X-RAY FINDINGS IN TUBERCULOUS CHILDREN ACCORDING TO AGE AT DISCOVERY OF INFECTION

In making an analysis of initial x-ray findings it was essential to use only broad classifications. There were films without definite lesion in spite of the known positive reaction to tuberculin; a second group contained those showing only nodal lesions at the mediastinum, with or without the characteristically small primary focus visible; and a third class was made for the parenchymal lesions of the childhood type, nearly always rather gross shadows resembling pneumonias and invariably associated with enlarged mediastinal nodes. Instances of miliary dissemination were entered in this class as well. A separate grouping was made for reinfection tuberculosis with its typical soft infiltration, usually beginning peripherally and nearly always located in the upper lobe, and in most instances appearing long after the primary complex had healed. When the same film showed lesions quite different in type, it was classified as belonging in the group considered to contain the more serious and extensive disease.

Tables 2 and 3 show the initial x-ray findings for white and colored by separate years to age 5, then for age groups 0–4, 5–9, and 10–14. Inspection of Table 2 for 404 white children shows that infected infants under 1 year of age had the smallest percentage of negative films and the largest percentage of parenchymal lesions of any age up to age 15. Only about 33 per cent escaped lesion of some kind, 22 per cent showed nodal tuberculosis, and 45.5 per cent displayed parenchymal involvement of the childhood type. As age increased, parenchymal involvement at first x-ray examination became less common, and had fallen to about 18 per cent for children age 1 year, and was found in only 8 per cent of the children examined for the first time at age 2 years. After 5 years of age, involvement of the lung parenchyma occurred only twice in 168 infected white children. One of these cases was reinfection tuberculosis in a 6 year old child whose disease became arrested after several years of observation. By 5 years of age it was usual to encounter nodal lesions of the mediastinum in about 30 per cent of the children examined for the first time, and this remained fairly constant to 15 years of age.

The corresponding tabulation for 744 colored children is shown in Table 3. Percentages for the first year of life are

TABLE 2

*Distribution of Initial X-ray Findings in 404 Tuberculin-Positive White Children, According to Age at Examination*

| Age | Number of children examined | Primary Tuberculosis: X-ray negative | | Primary Tuberculosis: Nodal disease only | | Primary Tuberculosis: Parenchymal lesions | | Reinfection Tuberculosis | |
|---|---|---|---|---|---|---|---|---|---|
| | | Number | Per cent | Number | Per cent | Number | Per cent | Number | Per cent |
| Under 1 | 55 | 18 | 32.7 | 12 | 21.8 | 25 | 45.5 | ... | ... |
| 1 | 85 | 41 | 48.2 | 29 | 34.1 | 15 | 17.6 | ... | ... |
| 2 | 58 | 24 | 63.2 | 11 | 28.9 | 3 | 7.9 | ... | ... |
| 3 | 24 | 20 | 83.3 | 4 | 16.7 | 0 | .... | ... | ... |
| 4 | 34 | 25 | 73.5 | 7 | 20.6 | 2 | 5.9 | ... | ... |
| 0–4 | 236 | 128 | 54.2 | 63 | 26.7 | 45 | 19.1 | ... | ... |
| 5–9 | 126 | 82 | 65.1 | 42 | 33.3 | 1 | 0.8 | 1 | 0.8 |
| 10–14 | 42 | 30 | 71.4 | 12 | 28.6 | 0 | .... | ... | ... |
| Total | 404 | 240 | 59.4 | 117 | 29.0 | 46 | 11.4 | 1 | 0.2 |

TABLE 3

*Distribution of Initial X-ray Findings in 744 Tuberculin-Positive Colored Children, According to Age at Examination*

| Age | Number of children examined | Primary Tuberculosis: X-ray negative | | Primary Tuberculosis: Nodal disease only | | Primary Tuberculosis: Parenchymal lesions | | Reinfection Tuberculosis | |
|---|---|---|---|---|---|---|---|---|---|
| | | Number | Per cent | Number | Per cent | Number | Per cent | Number | Per cent |
| Under 1 | 92 | 27 | 29.3 | 21 | 22.9 | 44 | 47.8 | ... | ... |
| 1 | 163 | 64 | 39.3 | 33 | 20.2 | 66 | 40.5 | ... | ... |
| 2 | 79 | 31 | 39.2 | 18 | 22.8 | 30 | 38.0 | ... | ... |
| 3 | 58 | 29 | 50.0 | 18 | 31.0 | 11 | 19.0 | ... | ... |
| 4 | 60 | 37 | 61.7 | 12 | 20.0 | 10 | 16.7 | 1 | 1.7 |
| 0–4 | 452 | 188 | 41.6 | 102 | 22.6 | 161 | 35.6 | 1 | 0.2 |
| 5–9 | 200 | 126 | 63.0 | 61 | 30.5 | 11 | 5.5 | 2 | 1.0 |
| 10–14 | 92 | 52 | 56.5 | 33 | 35.9 | 5 | 5.4 | 2 | 2.2.. |
| Total | 744 | 366 | 49.2 | 196 | 26.3 | 177 | 23.8 | 5 | 0.7 |

almost identical with those for white infants. Colored tuberculin-positive children, however, continued to show this high prevalence of parenchymal involvement not only under 1 year, but also at age 1 and at age 2, with percentages at ages 3 and 4 years beginning to drop off and to approximate the findings for white infants at age 1 year. In colored children infected before 5 years of age, parenchymal lesions were found at first x-ray in nearly 36 per cent of those examined, while for infected white children of similar age, such extensive involvement was encountered in 19 per cent.

For infected colored children more than 5 years of age when first examined, there was a marked drop in the prevalence of serious lesions, but they were much more numerous than in the white children of the same age. Parenchymal disease of the childhood type never dropped lower than 5 per cent at any age.

While there were only 5 cases of reinfection tuberculosis discovered at initial examination among 744 infected colored children, it should be said parenthetically that 19 others developed this type under observation; while in the white children studied, the one child among 404 who showed it on admission was the only instance encountered at any time in white children of this series.

### MORTALITY FROM TUBERCULOSIS

In studying mortality from tuberculosis in these children, the number of

TABLE 4

*Mortality from Tuberculosis During Various Time Periods After Discovery of Infection in 178 White and 334 Colored Children Found to be Tuberculin-Positive Before 3 Years of Age*

| Interval from discovery of infection | Number of deaths during interval | | Mortality per cent during interval | |
|---|---|---|---|---|
| | White | Colored | White | Colored |
| First year | 8 | 37 | 4.5 | 11.2 |
| First 5 years | 14 | 57 | 8.1 | 18.3 |
| First 10 years | 14 | 59 | 8.1 | 19.8 |

observed deaths was related to the duration of observation of each individual, making it possible to calculate the risk of dying within 1 year or for any longer interval of time after the discovery of infection. The procedure followed was the modified life-table method, the application of which has already been described in detail in earlier publications.[2, 3]

Mortality tables were set up for 10 years of observation of children falling into two different age groups at the time infection was discovered: those infected before age 3, and those found to be infected between ages 3 and 15 years. Only summary tables are presented here, derived from the more detailed calculations of the probability of dying.

Table 4 presents in summary form the mortality from tuberculosis in 512 children infected before age 3, of whom 178 were white and 334 were colored. For both races deaths were more frequent during the first year following discovery of infection than for any later annual period, and they account for more than half the mortality observed over ten years. At every time period shown, the colored suffered a mortality more than twice that of the white. For the first year following the discovery of infection, mortality was 4.5 per cent for the white and 11 per cent for the colored; at the end of 5 years the cumulative mortality for white was 8 per cent and for colored was 18 per cent. For the whole 10 year period, mortality from tuberculosis stood at 8 per cent for the white and had risen to 20 per cent for the colored.

In Table 5 the 512 children infected before 3 years of age are classified according to the presence or absence of

TABLE 5

*Mortality from Tuberculosis in 512 Children, Infected Before Age 3, During Various Time Periods Following the Discovery of Infection, According to Lesion Shown at Initial X-ray Examination*

| Race | Number of Cases | Deaths from Tuberculosis: Within 1 year | | Within 5 years | | Within 10 years | |
|---|---|---|---|---|---|---|---|
| | | Number | Per cent | Number | Per cent | Number | Per cent |
| *Parenchymal lesion in first x-ray* | | | | | | | |
| White | 43 | 7 | 16.3 | 9 | 20.9 | 9 | 20.9 |
| Colored | 140 | 31 | 22.1 | 44 | 32.4 | 46 | 35.8 |
| Total | 183 | 38 | 20.8 | 53 | 29.6 | 55 | 32.0 |
| *No Parenchymal lesion in first x-ray* | | | | | | | |
| White | 135 | 1 | 0.8 | 5 | 3.9 | 5 | 3.9 |
| Colored | 194 | 6 | 3.2 | 13 | 7.6 | 13 | 7.6 |
| Total | 329 | 7 | 2.2 | 18 | 6.0 | 18 | 6.0 |

parenchymal lesion in initial x-ray, and their mortality studied with these differences in mind. One hundred eighty-three showed parenchymal involvement, only one of which had reinfection tuberculosis. There were 329 children who showed only nodal disease or films without definite lesion.

Among 183 children showing parenchymal disease, 38 deaths from tuberculosis occurred within 1 year, a mortality of 21 per cent. This had risen to 30 per cent by the end of 5 years, and to 32 per cent by the close of 10 years of observation. Although mortality for the 43 white children during the first year of observation was 16 per cent while that for the 140 colored children was 22 per cent, this difference was not large enough to exclude the operation of chance. At later time intervals this racial difference became greater, the 10 year mortality being 21 per cent for white and 36 per cent for colored.

The remaining 329 children infected before age 3 whose first films showed no parenchymal lesion are shown in Table 5, with a combined mortality for the first year of observation of 2.2 per cent, to be contrasted with the first-year mortality of 21 per cent for children showing parenchymal shadows. By the end of 5 years of observation, the cumulative mortality for the combined races had become 6 per cent with no increase in mortality thereafter; and this figure is roughly one-fifth the risk noted for children admitted with more extensive disease.

The two races showed a difference in the force of mortality where the initial film showed no parenchymal lesion. The first-year rate for white children was 0.8 per cent; for colored it was 3.2 per cent, a fourfold difference. At the end of 5 years the rate had risen to nearly 4 per cent for white and 7.6 per cent for colored, and these rates stood for the total 10 year risk of death from tuberculosis.

The 140 colored children with initial parenchymal involvement, shown in Table 5, represent 42 per cent of the infected children examined under 3 years of age, while the 43 white children admitted with definite pulmonary lesions represent only 24 per cent of the infected white children under 3 years of age. This difference is highly significant statistically. The higher mortality from tuberculosis in colored children appears to be associated with their tendency to develop extensive lesions of the lung parenchyma more frequently than do white children. It has been shown in an earlier publication that even if they are admitted without parenchymal disease, they show a greater tendency to develop it within the next few months than do white children of similar age.[4]

Mortality became greatly diminished for children found to be infected later than age 3; and separate analyses for various age groups, each containing only small numbers of children, failed to reveal striking differences in the risk of death. Accordingly, children admitted at any age between 3 and 15 years of age have been considered together, and the mortality for 226 white and 410 colored children at various time intervals following infection is shown in Table 6 in summary form.

Only one death took place among the 226 white children. This occurred in a child admitted to observation with tuberculous pneumonia at age 6 and dying of tuberculous meningitis a few weeks later. This mortality of 0.4 per cent represents the total 10 year risk and is in contrast to the 10 year mortality of 8 per cent for white children infected prior to 3 years of age.

In the group of 410 colored children, 12 deaths from tuberculosis took place during the first year of observation, giving an observed mortality of 3 per cent. This rate had risen to 5 per cent by the end of 5 years, and to 7.6 per cent at the close of 10 years, a figure

TABLE 6

*Mortality from Tuberculosis in 226 White and 410 Colored Children Whose Infection Was Discovered Between Age 3 and Age 15 Years; no Separation for Lesion*

| Interval from discovery of infection | Number of deaths during interval | | Mortality per cent during interval | |
|---|---|---|---|---|
| | White | Colored | White | Colored |
| First year | 1 | 12 | 0.4 | 3.0 |
| First 5 years | 1 | 20 | 0.4 | 5.3 |
| First 10 years | 1 | 23 | 0.4 | 7.6 |

to be compared with a death rate of 19.8 per cent calculated for colored children infected before 3 years of age. The colored have a mortality only about half as high if they are found to be infected later than age 3. It is interesting to see how closely the mortality rates for the older *colored* group approximate those for the younger *white* group. Thus tuberculin-positive colored children at their more favorable period in childhood have a mortality from tuberculosis which just about equals the rates of infected white children at their more critical period.

The study of mortality in older children of the white race, according to extent of initial lesion, proved to be very simple. The 222 white children found infected after age 3 and showing no parenchymal involvement initially were all alive at the time these records were compiled. There were only 4 instances of initial parenchymal involvement and of these 1 had died within 1 year.

As usual, however, the colored presented a more striking picture. Forty-two of the 410 colored were admitted with pulmonary lesions visible in the initial film, and this 10 per cent is to be contrasted with 42 per cent showing such lesions when infection had occurred before 3 years of age. Thirty-seven of these 42 were regarded as parenchymal lesions of the childhood type, and their mortality can be compared with that of younger colored children showing comparable lesions.

Table 7 shows the mortality of these older colored children according to the presence or absence of childhood parenchymal lesions. There were 37 with parenchymal lesion and 368 without this finding initially.

Among the 37 instances of initial parenchymal disease, 9 deaths were observed during the first year of clinic observation, giving a mortality of 24 per cent; this had risen to nearly 34 per cent by the end of 5 years, and to 38 per cent for the whole 10 years of

TABLE 7

*Mortality from Tuberculosis in 405* Colored Children Whose Infection Was Discovered Between Ages 3 and 15 Years, According to Initial X-ray Findings*

| Initial x-ray findings | Number of cases | Deaths from Tuberculosis | | | | | |
|---|---|---|---|---|---|---|---|
| | | Within 1 year | | Within 5 years | | Within 10 years | |
| | | Number | Per cent | Number | Per cent | Number | Per cent |
| Parenchymal lesion | 37* | 9 | 24.3 | 12 | 33.7 | 13 | 38.2 |
| No parenchymal lesion | 368 | 0 | .... | 4 | 1.3 | 6 | 3.3 |

* Exclusive of 5 cases of reinfection tuberculosis, 4 of whom died.

follow-up. These rates are nearly identical with those for colored children shown in Table 5 whose initial examination before age 3 years showed parenchymal involvement. It is probably justifiable to conclude that, for the colored, parenchymal lesions of the childhood type at any age during childhood carry about the same risk of death that they do in infancy.

The 368 colored children between the ages of 3 and 15 years, when examined and found to have no parenchymal lesion, showed similar percentages of nodal lesions and negative films as the younger group; yet this older and larger group suffered no deaths at all during the first year of observation, had a mortality of only 1.3 per cent by the end of 5 years, and a total mortality from tuberculosis of 3.3 per cent by the end of 10 years. This 10 year rate was less than half that calculated for colored children with comparable lesions whose infection took place before 3 years of age. We conclude that as the colored child grows older, if his tuberculous infection has produced no more than nodal disease at the time his infection is discovered, he has more capacity to control his disease than the infant with nodal involvement.

In Table 7 it was noted that there were 5 children of the colored race whose initial films showed reinfection tuberculosis. Their ages were 4, 6, 9, 13, and 14 years respectively. Four of these died in less than 2 years, 1 of tuberculous meningitis rather soon after the discovery of tuberculosis, the other 3 of pulmonary tuberculosis. The 5th child, a girl of 13 years of age when observation began, had been followed 6 years when these records were compiled, and at that time her disease was considered arrested. Reference has already been made to 19 colored children admitted without reinfection tuberculosis who developed this type while under observation. There was only one white child of this study who showed reinfection tuberculosis on admission, and none was observed to develop it subsequently.

There was a total of 73 deaths from tuberculosis in children whose infection took place before 3 years of age. Fourteen of these fatalities were among white, and 59 among colored children. The immediate cause of death is shown in Table 8. Extra-pulmonary tuberculosis, notably miliary tuberculosis and tuberculous meningitis, accounted for more than 80 per cent of these deaths, and tuberculous pneumonia appeared to be the immediate cause of death in 16 per cent. Reinfection tuberculosis accounted for only 1 per cent. In the same table are shown the 24 deaths occurring in children whose infection was discovered between ages 3 and 15. All but one of these fatal cases were colored. Extrapulmonary tuberculosis was the immediate cause of death in less than 42 per cent, tuberculous pneumonia was considered responsible for death in 17 per cent, and reinfection

TABLE 8

*Immediate Cause of Death from Tuberculosis in 73 Children Infected Before Age 3 and in 24 Children whose Infection Was Discovered Between Ages 3 and 15 Years*

| | *Infected before Age 3 Years* | | *Infection Found Between Ages 3 and 15 Years* | |
|---|---|---|---|---|
| *Cause of Death* | *No. of deaths* | *Per cent* | *No. of deaths* | *Per cent* |
| Miliary Tuberculosis | 32 | 43.8 | 4 | 16.7 |
| Tuberculous Meningitis | 26 | 35.6 | 6 | 25.0 |
| Other Extrapulmonary Tuberculosis | 2 | 2.7 | 0 | .... |
| Post-Primary Tuberculous Pneumonia | 12 | 16.5 | 4 | 16.7 |
| Reinfection Tuberculosis | 1 | 1.4 | 10 | 41.6 |
| Total Fatalities | 73 | 100.0 | 24 | 100.0 |

tuberculosis was the cause of death in the remaining 42 per cent.

SUMMARY

In a series of 404 white and 744 colored children less than 15 years of age when found positive to tuberculin, chest lesions demonstrable at initial x-ray examination were more frequent and more serious in extent the younger the child. Infected children under 1 year of age behaved with remarkable similarity irrespective of race, showing enlarged tracheobronchial lymph nodes in about 22 per cent and extensive lesions of the lung parenchyma in 47 per cent. For *white* children a prompt reduction in the frequency of parenchymal lesions was noted as early as age 1 year, but *colored* children showed a sustained high prevalence of such lesions at initial examination for the first 3 years of life and barely approximated the decreasing risk noted in 1 year old white infants by the time they had reached 5 years of age.

Among older children, between 5 and 15 years of age at first examination, roughly 30 per cent of infected children of both races showed nodal involvement. For the *white*, parenchymal lesions of any kind were rare, occurring in less than 2 per cent. For the colored, parenchymal involvement of the childhood type appeared in nearly 6 per cent of initial films, and lesions of reinfection tuberculosis were seen in more than 1 per cent at first examination.

Over a 10 year period of observation, mortality from tuberculosis in white children infected before age 3, was calculated to be 8 per cent, while for colored children it was nearly 20 per cent. For both races more than half the risk of death was concentrated within the first year of known infection. Where infection was discovered between ages 3 and 15 years, the 10 year mortality for white children was 0.4 per cent, and for colored it was 7.6 per cent.

Mortality was much higher for children admitted with parenchymal lesion. For the combined races, if infection took place before age 3, mortality was 21 per cent within 1 year, had risen to 30 per cent by the end of 5 years, and to 32 per cent for the whole 10 year period. Evidence was presented suggesting that white and colored suffer about equal risk of death if parenchymal disease can be demonstrated. The colored show many more of these serious lesions than do white children. Lesions of the lung parenchyma on first x-ray in older children of the colored race carried the same mortality as in younger children, but at these ages they were less frequent.

The total 10 year mortality from tuberculosis in white children infected before age 3 and showing only nodal lesions or negative films was about 4 per cent, while for the colored it was 7.6 per cent. White children presenting similar findings at first x-ray between ages 3 and 15 suffered no mortality during the period of observation, but colored children between these ages whose initial films showed no parenchymal lesion suffered a mortality of 3.3 per cent within a 10 year observation period. The lower death rate in children past infancy appears to be related to the lessened frequency of parenchymal involvement and to an improved resistance to nodal lesions.

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# Public Health Organization in Mexico*

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SINCE the present Constitution of Mexico was enacted in 1917 public health in Mexico has been under the care of an autonomous institution, which is a part of the executive branch of the Federal Government. It is the Federal Department of Public Health and the National Council of Health. Its chief is a member of the Presidential Cabinet.

This was the first step taken on becoming aware of the great vital public health problems which the nation has to solve. As health education of the public spread over the country and new demands for health activities came from every corner of the nation, there followed a progressive increase in the budgets to meet the ever increasing requirements for health. On the other hand, the rapid development of communications has opened the road to the propagation of infectious and parasitic diseases which before were restricted to certain zones, with the result that the ancient division between national and local problems has been broken down. Thus, although the supreme sanitary law, the Federal Sanitary Code, marks the division of activities for federal and local authorities, it also invests the Federal Department of Health with full authority to act when the health of the nation is in danger, or when there is a neglect of duty by a local government. The last federal Sanitary Code was enacted in 1934, and by it the Federal Department of Health is authorized, first, to nominate a representative for every state and territory, and, second, to sign agreements with the local governments to coöperate with them and coördinate their efforts to get a single direction and orientation in the solving of public health problems either of general or local interest. This coöperative plan permits the Department of Health to guide and supervise all health activities over the country, and avoids many misunderstandings and duplication of activities which existed when several health organizations operated in a single state.

In effect then the basic organization of public health in Mexico is centralized in the state health officer, who is appointed by mutual agreement of the federal and local governments, and under this arrangement. With steadily growing appropriations, it has been possible to enlarge services, increase their number, and improve the health of the people at large.

The appropriations of the Federal Department of Health during the present decade are shown in Table 1.

TABLE 1

| *Year* | *Appropriation* | *Per cent of Federal Budget* |
|---|---|---|
| 1933 | $6,532,487.46 | 2.79 |
| 1934 | 7,499,945.81 | 2.91 |
| 1935 | 10,480,000.00 | 3.80 |
| 1936 | 12,940,000.00 | 4.50 |
| 1937 | 14,870,000.00 | 4.46 |
| 1938 | 13,900,000.00 | 3.33 |
| 1939 | 16,500,000.00 | 3.70 |
| 1940 | 16,500,000.00 | 3.69 |
| 1941 | 19,000,000.00 | 3.88 |
| 1942 | 24,000,000.00 | 4.35 |

* Presented before the Health Officers Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 28, 1942.

To these appropriations must be added appropriations of the individual states, so an average of $1.00 to $1.50 Mexican currency has been spent per capita during the last five years.

The advantages of the newer arrangement can better be understood on matters of sanitation and control of communicable diseases, as the Federal Government is more able to provide for economical and technical resources than is a local one. Further, when such problems arise, the Federal Department of Health is free to mobilize its forces in a kind of guerilla warfare, without hurting the sovereignty of an individual state.

In accordance with these general purposes, the Federal Department of Health is organized to extend its activities to all the aspects of modern public health practice. The present basic organization is as follows:

*A. National Board of Health—*

The National Board of Health, created by the Constitution of 1917, has advisory legislative, and judicial powers. It is formed by the heads of the higher offices and the directors of technical and administrative offices. They hold sessions every week and more often when an emergency arises.

*B. Federal Department of Health—*

1. *Higher offices*

a. *Chief of the Department*

As stated above, the Chief of the Department of Health in Mexico is a member of the Presidential Cabinet. He orients the general policies and guides the activities of the Institution.

b. *Secretary General*

The Secretary General has a rank equivalent to an undersecretary, and his activities are executive. He is in charge of all the technical activities of public health.

Depending directly upon the Secretary General are:

(1) *The School of Public Health and Hygiene*
(2) *The Office of Technical Supervision*
(3) *The Office of International Interchange*

c. *Chief Clerk*

The chief clerk or higher officer handles all matters concerning the administrative and financial aspects of public health. Under his care are the general administration office, the offices of administrative inspection, and legal administrative procedures. In the latter respect, it is worth while to state that the Federal Department of Health acts in a judicial capacity, as it can fine or even imprison any offender without any legal warrant, provided such an action is based on the law and regulations. This authority is extended to health officers in the states.

The different activities in public health are under the care and direction of the following group of divisions, which act in an advisory and supervisory capacity.

Such divisions can be gathered under three main headings:

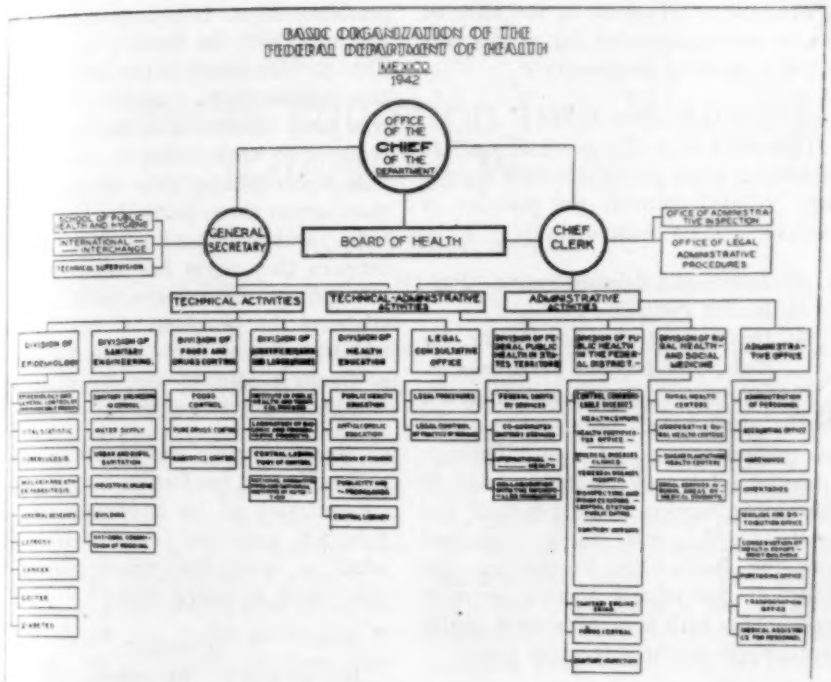
A. *Technical—*

1. *Division of Epidemiology*
   a. *Bureau of Biostatistics*
   b. *Bureau of Epidemiology and General Control of Communicable Diseases*
   c. *Bureau of Tuberculosis*

With this Bureau, the National Tuberculosis Committee coöperates very efficiently, and coördinates its efforts against tuberculosis.

d. *Bureau of Malaria and other Parasitosis*

Malaria and other parasitic diseases




like hookworm and onchocerciasis constitute such a problem in Mexico that the Federal Department of Health has established a special bureau in order to give particular attention to the solution of these vital problems of rural communities.

e. *Bureau of Venereal Disease Control*

f. *Section of other Preventable Diseases*

Several sections are in charge of the prophylaxis of leprosy, cancer, goiter, diabetes, and other preventable diseases.

2. *Division of Sanitary Engineering*

The Division of Sanitary Engineering includes various bureaus in charge of general sanitary engineering problems, urban and rural sanitation, industrial hygiene, the housing commission and water supplies. This last activity is one of the most important of this division. It may seem paradoxical that, although Mexico is a tropical country, it is at the same time a dry one, and the Federal Government has to provide many rural zones with public water supplies. A special fund is set aside to finance water for rural communities.

3. *Division of Pure Foods and Drugs*

4. *Division of Research and Laboratories*

a. *The Institute of Public Health and Tropical Diseases for Research Work*

b. *The Central Laboratory*

c. *The Laboratory of Biologicals and Pharmaceuticals*

d. *The National Nutrition Committee and Institute*

5. *Division of Health Education*

The Division of Health Education orients and directs all educational activities to the public and provides the means and materials for such purposes.

A Museum of Hygiene in the City of Mexico was inaugurated during this year and it is growing progressively.

6. *Law Consulting Office*

This office is in charge of all matters concerning legal procedures and legislation. It also controls the practice of medicine and its branches.

B. *Technical and Administrative—Public Health Practice—*

1. *Division of Public Health for States and Federal Territories*

This division is the central office for all the state health organizations, and has control over all of them. Through a special bureau all matters related to quarantine services are supervised and controlled. A special bureau organized with the Rockefeller Foundation, the Office of Specialized Health Services, experiments with new methods of health practice, particularly in rural zones.

2. *Division of Rural Hygiene and Social Medicine*

Due to certain characteristics of rural Mexico, which constitutes about 80 per cent of the country, and due more particularly to our rural organization and distribution of land, the Federal Department of Health has been obliged to organize institutions which provide for medical care and public health activities in those rural zones which belong to rural communities and coöperative systems, called "Los Ejidos" (The Commons).

The health and medical care of people in these organizations are taken care of by the rural health centers which are financed either by the Federal Government alone, by coöperation with the "Ejidatarios" (commoners), or by the farmers themselves. This undoubtedly represents a step forward in the solution of the numerous problems with which Mexico has been faced since our Independence days. It is augmented by cooperation with the Faculty of Medicine. This division sends to the field under its care and auspices, students of medicine who have finished their studies and are required to work during 6 months in the field before getting their diplomas. This plan serves three purposes, i.e., to provide rural communities with medical services they never had before, to find out through the surveys made by those students the problems of the zones in which they work, and to give the student a practical idea of the problems they will have to face in their future practice.

C. *Administration and Finances—*

To this end, the Department of Health concentrates all its administrative and financial activities in a central office which is under the jurisdiction of the chief clerk as stated above.

## SUMMARY

In summary, this rapid glance at what Mexico is doing to solve its tremendous health problems and to keep step with the rest of the civilized world, emphasizes once and again that in public health administration there are neither standards nor norms which can be applied to every country, to all zones, and to all places alike. But at the same time we are aware that public health administration must be dynamic and never static.

So Mexico is looking forward to higher and higher standards of medical and health work, and to a more complete utilization of the invaluable aid which medicine, both curative and preventive, can give to its people, when it is practised in a coöperative spirit; but watchfulness and unselfish pains are always necessary, whatever the particular lines enlarged application of medical efficiency may take, and as the poet said:

Does the road wind uphill all the way?
Yes, to the very end, my friend.

# Health Education in a War Relocation Project*

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I HAVE been asked to tell something of my recent two months' experience in a War Relocation Project. What of the organization for public health education among people torn from their homes by the necessities of war? I can give you a picture of the problem. I can point out some of its difficulties and some of its possibilities. I cannot, as yet, describe the problem as solved nor the program for health education organized. Public health workers, however, may recognize some of the factors present in this situation as characteristic of other new communities which are springing up throughout the land.

Migrations within civil populations have been unprecedented since Pearl Harbor. The evacuation of all citizens as well as aliens of Japanese ancestry from the west coast is only one example. While the military removal of civil populations is a strange experience in America, the shifting of populations through other necessities is not new. The "dust bowl" of the Middle West caused one such migration. The present increase of armed forces with the concomitant mushrooming of industry has brought another.

Americans and aliens of Japanese ancestry living on the west coast have gone through a cataclysmic period since February 19, 1942, when the Secretary of War was given authority to prescribe military areas from which "any or all persons may be excluded." As a wartime necessity the War Department has evacuated some 100,000 persons from the west coast which was designated a military zone. Never in American history has there been a similar forced migration of such gigantic proportions.

These people, well over 60 per cent of whom were American born citizens, educated in public schools, taught by Caucasian teachers, schooled in democratic living, abandoned their homes and business enterprises and went to temporary assembly centers to await the preparation of permanent relocation projects. Dangerous aliens or individuals whose loyalty was suspected were not included here but were interned in prison camps. Relocation projects for these people have now been set up in 7 different states and are 10 in number. They were designed to provide habitation for evacuees and to give them an opportunity to work at industries which contribute to the country's present need, namely, food production and the manufacture of certain war materials.

Near the western boundary of Arizona on the Colorado River Indian Reservation 90,000 acres of fertile mesquite covered land lay waiting development into irrigated farms early in April. A dam had recently been completed so that water might be taken from the

* Presented at a Joint Session of the American School Health Association, and the Public Health Education and Public Health Nursing Sections of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 28, 1942.

river. Otherwise it was untouched desert. On May 12, just one month later, the first of the evacuees began to arrive. By the first week in September the population had risen to 17,819, and the settlement under the name of Poston had become the third largest city in the State of Arizona.

During this short period Army engineers had superintended the construction of barracks, the installation of a water system, the building of a sewage disposal plant, the construction of food storage facilities in a climate where temperatures reach well over 120°, and the building and equipment of hospital and clinic facilities for a community of 20,000 people.

The camp is laid out in 71 blocks, each of which houses some 250 or more people in 14 barracks containing 56 separate rooms, each 20 feet wide and 25 feet long. Separate buildings provide shower and toilet facilities for men and women, and there is a laundry building. Each block has one mess hall and kitchen and a recreation building for meetings and other activities. The necessities of life were thus provided in a wilderness for 20,000 people accustomed to 20th century American standards of living. Men, women, and children faced a new life and new work. How did they go about it?

The first step when a block was filled with evacuees was to organize a temporary local administrative staff. A block manager was chosen from the group. His function was to look after the needs of his community, listen to requests and complaints, pass on information for the guidance of the people, and to provide the channel for interchange of information between the general administrative staff of the project and the people.

The first duty of the manager was to see that the people were fed. Volunteer cooks were solicited from the group. The preparation and serving of food in the common mess hall would have taxed the ingenuity of experienced and well trained cooks. The divergent tastes of youth, American born and accustomed to American food habits, and the tastes of old age, still clinging to the culture of the mother country, had to be met. Infants, who in addition to special milk formulae, required simple well cooked foods suitable for the first year of life, must be fed. The runabout child with his growth and energy requirements, not yet ready to digest and assimilate the highly seasoned combinations of food which older people crave, must be looked after. There were diabetics and minor cases of illness whose special feeding the home could not now provide. All of these nutritional problems were faced by volunteer cooks with no training and certainly no extensive understanding of the health implications involved.

The matter of nutrition gave the administrative staff deep concern. Careful checking, which showed that some of the 71 mess halls provided excellent food from the same supplies that seemed inadequate in other kitchens, indicated the problem to be one of local leadership. Plans were initiated for training each kitchen staff in the preparation and serving of palatable food, the planning of adequate menus from the food available, and for giving special training to selected persons in the preparation of food for infants and children and for invalids.

Rationing and transportation difficulties were two factors which entered into the problem of nutrition. These will increasingly disturb nutrition everywhere. Knowledge of food values and of alternate sources of essential foods is necessary to meet these problems.

Before discussing the organization of the community for health education it is necessary to understand the needs of the people and some of the peculiarities of the community in which they live. Some of the factors observed at Poston are common to other migrant groups,

and as such may possess significance to public health workers in areas given over, for example, to war industries.

A cursory investigation revealed at once the tremendous need for education, not alone for information, or for training in procedures for health protection, but over and above all else, for assurance, for morale, for a sense of security, for mental hygiene, by a people whose lives had been wrested from their foundations.

Here were people, many of whom had come from urban communities, suddenly thrust out on the desert, deprived of the security of their own homes, their accustomed community organization and services, and their economic independence, facing unknown, and to them terrifying, dangers. The heat, the dust, the rattlesnakes, the scorpions and the spiders were all factors in an environment new and strange and threatening. Regardless of the seriousness of these threats, the people needed to be reassured. They needed to know how to live in safety and some degree of comfort in temperatures above any they had ever experienced. They needed to know how to use salt to replace that lost by the body through perspiration. They needed to know, as the dust swirled around them in clouds, that dust blown from an open field, disagreeable as it may be, is a nuisance rather than a health hazard and that it does not threaten them with tuberculosis or silicosis. They needed to know the truth about the danger from insects and to have their fears removed regarding rattlesnakes.

Fear of the unknown is instinctive and is necessary to self preservation in an unfriendly world. But freedom from fear is one of the freedoms Americans are fighting for and it requires education. To enjoy security, health, peace of mind, man must know and understand the environment in which he lives.

Here was a community in which adequate provision had been made for the necessities of community living; for safeguarding health through proper facilities for sewage disposal; through a safe and well guarded water supply; through an organized and well equipped fire department; through food doubly inspected and safeguarded as to quality and safety. Here was a community provided with a hospital staffed by well trained physicians and surgeons and equipped to meet any ordinary emergency. Yet, with all this, fears based on ignorance of what had been done to safeguard the community were rampant. Rumors that the water was not safe, that the sewage disposal plant was inadequate, that the fire fighting equipment was not up to standard, that the food was spoiled, that the hospital could not perform the simplest emergency operation ran through the community to destroy morale. The community needed to know the services that had been provided and how to use them wisely.

The situation at Poston was not unusual. Any community, be it old or new, must provide opportunities for the public to become familiar with community services if these are to be satisfactorily used. The best community services in the world fall short of fulfilling their function when the people are not secure in their use.

Large numbers of calls came in to the hospital for medical home visits—calls in excess of what could be met by the limited medical staff. In some cases these were for urgent conditions, but more often they were for minor ills. There was need for educating the public in the proper use of the medical facilities. With the increasing shortage of medical services available in every civilian community it is increasingly important that this education be provided everywhere.

The changed pattern of living, from that of the home unit to a group of fifty or sixty families, sharing a community mess hall, community showers

and latrines and laundry, presented another problem. It is difficult enough for soldiers to give up the privacy of home life and to share responsibility for the sanitation of a community shower and latrine, and to accept food which has been prepared to meet the needs of the group rather than the tastes of the individual. It is doubly hard for this adjustment to be made by whole families. Here again were unnecessary fears, bred by ignorance.

There was the fear of "athlete's foot," without adequate knowledge of how to protect oneself; fear of contracting one of the social diseases through the least likely avenue of infection, the common shower and latrine; fear of undernourishment because it was impossible to provide food for the family in the usual way. Mothers in particular needed help in making the adjustment to a new way of caring for their families. Their feeling of frustration in giving up control of the family life was acute. Yet there were constructive things to be done for the family that were within their control. Training in infant care and in home care of the sick were never more needed.

Turning from the problems felt by the people to a consideration of the group itself, an important characteristic is discovered. A new community lacks at first the coherence that makes work with it as a group possible. Coming from different localities, from all walks of life, and from divergent backgrounds, no one at first knows his neighbors and their capacities, or their potential contribution to the life of the community. People have not yet bound themselves together. Farm women living side by side with university graduates found little community interest. How helpful cohesiveness within a group can be is more fully appreciated after one has attempted to work in a community in which it is lacking. At Poston it was observed that some communities got together more quickly than did others and that those offered better opportunities for educational programs. The members of such groups came from similar backgrounds.

Another characteristic in this community was the fact that the channels through which education can function most effectively were not yet available. The health educator who goes into a new community will find it necessary to work with other groups on organization and the development of channels through which information may flow and by means of which members of the community may undertake to solve their own problems.

Under the leadership of the administrative staff, community services for the entire camp were organized. A census of the entire population was taken, and information as to the specific abilities of each person was classified. An employment bureau utilized this information in locating qualified individuals as they were needed for various tasks. A recreation department to provide immediate acitivities for young and old during the difficult period of adjustment was set up.

Church groups were organized. Daily vacation Bible and Buddhist schools were opened. Parents asked for nursery schools and young women volunteers organized these very creditably. Plans began to take shape for public schools, and young men and women, college graduates untrained in pedagogy, volunteered to take special teacher training which the administration offered. Volunteers set about making building bricks of adobe, since no materials were available for constructing schools. A news sheet was started by a group of young reporters and journalists. Adult classes in English and women's clubs began to appear. The machinery of self government was set up under the leadership of the legal members of the administrative staff and young evacuee lawyers.

Thus the channels for education began to take shape. The health department was organized under two branches, hospital and clinic services on the one hand, and public health services on the other. Under public health were included activities for communicable disease control, for sanitary inspections, for maternal and child welfare, for community nursing, for vital statistics and records, for nutrition, for health education.

If new communities lack the usual established channels for educational work, there are advantages to counterbalance this handicap. No set pattern can hamper the development of the program in accordance with the best thought of the present moment. It is possible to take the reports of national professional organizations, defining, for example, the functions of a health educator, and use these to set up the pattern for health education activities in the health department. The outline for school health policies, approved by recognized national groups, can be used to direct the program planning of the public school system. The lack of previously conceived ideas which might block sound development of the program is a decided advantage.

Because the slate was clear at Poston, plans could be made to permit maximum participation of the community in the discussion of its own problems. The organization of a Board of Health, on which were to be placed lay representatives of the community in addition to representatives of the professional group, was proposed. A channel would thus be provided through which the community could be kept informed as to the thinking that went on behind the passage of health and sanitary regulations. This channel would also serve to keep professional workers informed as to special situations in the home and community that had a bearing on the acceptance of these regulations. In this way the health program would stem from the community itself under the guidance of professionally trained personnel.

The health educator, working under the health department, utilizing the various channels opening up throughout the community, interpreting the community and its services to the people, will be able to bring about better understanding and better use of the services provided, and to bring new security to the people.

The need and opportunity for health education in this war relocation camp are doubtless a duplication of needs and opportunities in innumerable other communities throughout the land. The break-up of old patterns of living; the insecurity of masses of people living in new surroundings; the urgency of the need in industrial and civil and army life for man power, unhampered by physical ailments and mental stresses; the steadily diminishing professional health services in civil life, must all be faced. Whether in an evacuee camp or in factory or training center where essential war industry is going forward, a clear-cut recognition of the problems existing in communities made up of migrant groups is needed. The development of sound educational programs is one part of our program for winning the war.

# Field Observations of Tuberculosis Patients in Rural Areas of Tennessee*

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THE Tennessee Department of Public Health has maintained for a number of years mobile field units for tuberculosis case finding in the rural sections of the state. A clinician and an x-ray technician, using portable x-ray equipment, conduct regularly scheduled clinics in counties with local health departments.† Organization of the clinics and subsequent follow-up service are the responsibility of the local health officers and nurses. Recommendations concerning reëxamination, collapse therapy, and frequency of nursing visits are sent to the local health officer and the private physician with the report of the x-ray findings for each person examined. Since hospital facilities are limited for residents of the rural sections of the state and treatment must be carried out at home, the personnel of the local health departments have considerable responsibility in the control of the disease.

In order to understand fully the tuberculosis problem, information is necessary concerning the progress of the cases subsequent to diagnosis. What happens to the persons diagnosed as having tuberculosis? How long do they live? What effect does the extent of the lesion and sputum status have on mortality? What percentage receive hospital care? Answers to these and similar questions are valuable in formulating effective measures for the control of this disease.

Through regular visits to tuberculosis patients the local nurses routinely gather information which can be used in answering these questions. The local health departments are asked to send in periodically certain data which are readily available from records in the office. Query sheets are sent from the central office each month, requesting information concerning the present status (living or dead) of each case, whether or not collapse therapy has been received during the past twelve months, and dates of hospitalization for treatment of tuberculosis during that period.

These query sheets were first used in 1937 to learn the status of the cases diagnosed in 1936. The same information was requested concerning persons with active lesions and with lesions considered arrested at the time of diagnosis and, also, of children with first infection type lesions that were causing signs and/or symptoms. This paper presents the experience of tuberculosis patients diagnosed in field clinics from 1936 to 1940, inclusive. Nearly all of the data published elsewhere regarding the subsequent course of tuberculosis patients relate to persons who have received institutional care, while this study is concerned with patients of whom only a small percentage received hospital care or any form of special treatment.

In all, 5,056 white and 599 colored persons were under observation for periods of time varying from a few

* Presented before the Health Officers Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 28, 1942.

† The field units do not conduct clinics in the four counties with cities of 100,000 population or over since those counties have their own programs.

TABLE 1

*Classification of Cases of Tuberculosis According to Activity and Extent of Lesion on Diagnosis, by Color and Sex*

| Activity and Extent of Lesion | White | | | Colored | | |
|---|---|---|---|---|---|---|
| | Total | Male | Female | Total | Male | Female |
| Total Cases | 5,056 | 1,989 | 3,067 | 599 | 258 | 341 |
| Active | | | | | | |
| Minimal | 1,057 | 345 | 712 | 159 | 57 | 102 |
| Moderately Advanced | 1,151 | 478 | 673 | 141 | 59 | 82 |
| Far Advanced | 946 | 423 | 523 | 216 | 110 | 106 |
| Arrested | | | | | | |
| Minimal | 1,497 | 557 | 940 | 60 | 22 | 38 |
| Moderately Advanced | 320 | 148 | 172 | 7 | 3 | 4 |
| Far Advanced | 9 | 5 | 4 | .. | .. | .. |
| Manifest First Infection | 76 | 33 | 43 | 16 | 7 | 9 |

months to five years. The classification of these cases, according to activity and extent of lesion, by sex, is shown in Table 1.

Of the white cases regarded as active, 1,057 were classed as minimal, 1,151 as moderately advanced, and 946 as far advanced. The largest group of white patients (1,497) was that with minimal arrested disease, while the largest colored group (216) was that with far advanced disease. There were 159 colored persons with minimal active lesions, 141 with moderately advanced active, and only 67 with lesions considered arrested when first diagnosed. A higher proportion of the white patients under observation were females than males. This was due to a preponderance of females among those with minimal lesions, both active and arrested. Among the colored patients, also, the proportion of females was greater than that of males.

Since the age distribution of the cases is important in studying mortality, data are presented in Table 2 for three age groups, by color.

TABLE 2

*Age Distribution of Cases of Tuberculosis According to Activity and Extent of Lesion on Diagnosis, by Color*

| Activity and Extent of Lesion | Total | | Under 35 Years | | 35–54 Years | | 55 Years and Over | |
|---|---|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent | Number | Per cent |
| | | | | White | | | | |
| Total Cases | 5,056 | 99.9 | 2,231 | 44.1 | 1,938 | 38.3 | 887 | 17.5 |
| Active | | | | | | | | |
| Minimal | 1,057 | 100.0 | 692 | 65.5 | 297 | 28.1 | 68 | 6.4 |
| Moderately Advanced | 1,151 | 99.9 | 517 | 44.9 | 424 | 36.8 | 210 | 18.2 |
| Far Advanced | 946 | 100.1 | 556 | 58.8 | 272 | 28.8 | 118 | 12.5 |
| Arrested | | | | | | | | |
| Minimal | 1,497 | 99.9 | 349 | 23.3 | 788 | 52.6 | 360 | 24.0 |
| Moderately Advanced | 320 | 99.9 | 35 | 10.9 | 155 | 48.4 | 130 | 40.6 |
| Far Advanced | 9 | 100.0 | 6 | 66.7 | 2 | 22.2 | 1 | 11.1 |
| Manifest First Infection | 76 | 100.0 | 76 | 100.0 | ... | .... | ... | .... |
| | | | | Colored | | | | |
| Total Cases | 599 | 100.0 | 414 | 69.1 | 143 | 23.9 | 42 | 7.0 |
| Active | | | | | | | | |
| Minimal | 159 | 100.1 | 113 | 71.1 | 37 | 23.3 | 9 | 5.7 |
| Moderately Advanced | 141 | 100.0 | 92 | 65.2 | 40 | 28.4 | 9 | 6.4 |
| Far Advanced | 216 | 100.1 | 174 | 80.6 | 30 | 13.9 | 12 | 5.6 |
| Arrested | | | | | | | | |
| Minimal | 60 | 100.0 | 18 | 30.0 | 32 | 53.3 | 10 | 16.7 |
| Moderately Advanced | 7 | 100.0 | 1 | 14.3 | 4 | 57.1 | 2 | 28.6 |
| Manifest First Infection | 16 | 100.0 | 16 | 100.0 | ... | .... | ... | .... |

For the most part, those under observation were young adults with a higher percentage of colored patients in the younger age groups than of white. Of the individuals with active tuberculosis, 73 per cent of the colored and 56 per cent of the white were under 35 years of age. Persons with arrested lesions at the time of diagnosis were older than those with active lesions.

### MORTALITY EXPERIENCE

One method of studying mortality is to compare the actual number of deaths from all causes with the number expected. The actual number of deaths and the expected number,* according to activity and extent of lesion, with the ratios of actual to expected deaths, by color, are shown in Table 3.

TABLE 3

*Actual and Expected Deaths Among Tuberculosis Cases, with Ratios, According to Activity and Extent of Lesion on Diagnosis, by Color*

| Activity and Extent of Lesion | White | | | Colored | | |
|---|---|---|---|---|---|---|
| | Actual Deaths | Expected Deaths | Ratio Act./Exp. | Actual Deaths | Expected Deaths | Ratio Act./Exp. |
| Total Cases | 909 | 116.4 | 7.8 | 233 | 13.8 | 16.9 |
| Active | | | | | | |
| Minimal | 49 | 16.8 | 2.9 | 16 | 4.5 | 3.6 |
| Moderately Advanced | 220 | 25.4 | 8.7 | 45 | 3.3 | 13.6 |
| Far Advanced | 567 | 11.3 | 50.2 | 167 | 2.6 | 64.2 |
| Arrested | 71 | 62.4 | 1.1 | 3 | 3.2 | 0.9 |
| Manifest First Infection | 2 | 0.5 | 4.0 | 2 | 0.2 | 10.0 |

In this group of cases over 1,000 (909 white and 233 colored) deaths from all causes occurred, with more than one-half among those with far advanced disease. Only 49 deaths occurred among white patients with minimal active disease and 16.8 were expected in that group. In the moderately advanced active group, 220 deaths occurred, or 8.7 times as many as were expected, while among the far advanced there were 50 times as many as expected. The ratios of actual to expected deaths among the colored patients with active tuberculosis were: 3.6 to 1 for those with minimal lesions, 13.6 to 1 for those moderately advanced, and 64.2 to 1 for those with far advanced disease.

The 71 deaths observed in the white group with arrested lesions when first diagnosed were only slightly more than the number expected, 62.4, and the numbers of actual and expected deaths were the same for the colored patients with arrested lesions. Consequently, the death rate is not materially increased by persons with such a diagnosis.

When the data were divided according to age at death, the ratio of actual to expected deaths was higher in the age group under 35 years than in the older age groups for persons with active tuberculosis. However, there was no difference in the ratios according to age for those with arrested lesions. In considering these data from the viewpoint of administration of a tuberculosis program, it seemed advisable to discontinue follow-up service to individuals with arrested disease when diagnosed, since the mortality of this group was of the same order as that in the general population.

The experience in the state for white persons with active tuberculosis has been compared with that in Williamson County, Tenn.,[1] * and with that in Cat-

* To determine the number of deaths that would be expected, the age-specific death rates from all causes in Tennessee for the years 1938–1939 were applied to the population in each group.

* Data presented here for Williamson County include those contained in previous publications and also data gathered subsequent to publication.

taraugus County, N. Y.,[2] as shown in Table 4. Those diagnosed as tuberculous in the field clinics include persons examined because of symptoms referable to the chest and contacts of known cases. In Williamson County, the experience includes all known cases of tuberculosis in the county. The Cattaraugus County data are similar to those of Williamson County in that the method of selection of patients was the same. One difference between the two studies is that a high percentage of patients in Cattaraugus County received hospital care.

The ratios of actual to expected deaths were smaller for the Williamson County cases than for those diagnosed in field clinics in the state. This is probably due to the fact that the Williamson County data include individuals with little or no disability, as well as a larger proportion of cases in the older age groups. For Cattaraugus County, however, the ratios were of the same order as those obtained for the rural areas of Tennessee.

TABLE 4

*Ratio of Actual to Expected Deaths Among Active White Cases of Tuberculosis by Extent of Lesion on Diagnosis, for Rural Areas of Tennessee, for Williamson County, Tenn., and for Cattaraugus County, N. Y.*

| *Extent of Lesion* | *Rural Tennessee* | *Williamson County* | *Cattaraugus County* |
|---|---|---|---|
| Minimal | 2.9 | 0.7 | 5.3 |
| Moderately Advanced | 8.7 | 4.2 | 9.9 |
| Far Advanced | 50.2 | 13.9 | 48.1 |

In order to determine how long these patients live after diagnosis, the cumulative mortality from all causes during the first five years after diagnosis has been computed according to the method outlined in a previous publication.[3] Table 5 and Figure 1 show these percentages for the patients with active tuberculosis, by extent of lesion and color.

FIG. 1

CUMULATIVE MORTALITY FROM ALL CAUSES, PER 100, AMONG ACTIVE CASES OF TUBERCULOSIS DURING FIVE YEARS FOLLOWING DIAGNOSIS, BY EXTENT OF LESION AND COLOR

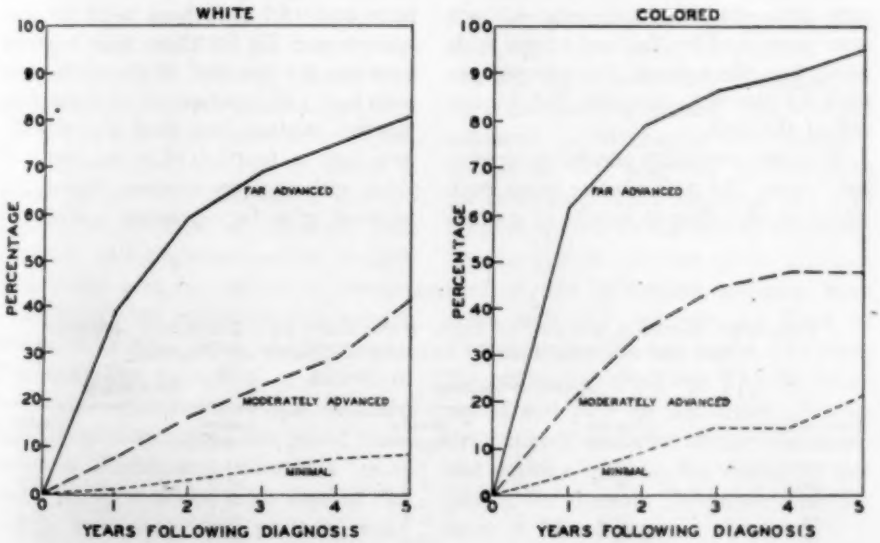


TABLE 5

*Cumulative Mortality from All Causes, per 100, Among Active Cases of Tuberculosis During Five Years Following Diagnosis, by Extent of Lesion and Color*

| Years Following Diagnosis | Minimal | | Moderately Advanced | | Far Advanced | |
|---|---|---|---|---|---|---|
| | White | Colored | White | Colored | White | Colored |
| 1st | 1.3 | 4.5 | 8.1 | 19.5 | 39.2 | 61.6 |
| 2nd | 3.4 | 9.6 | 16.5 | 35.1 | 59.6 | 79.1 |
| 3rd | 5.7 | 14.8 | 23.7 | 44.6 | 69.5 | 86.7 |
| 4th | 8.0 | 14.8 | 29.3 | 48.2 | 75.5 | 90.5 |
| 5th | 8.7 | 21.6 | 42.0 | 48.2 | 81.1 | 95.2 |

Mortality was excessive during the first year after diagnosis for persons with far advanced lesions, since 39.2 per cent of the white and 61.6 per cent of the colored cases were dead by the end of the first year. By the end of the fifth year, 81.1 per cent of the white patients having far advanced disease and 95.2 per cent of the colored had died. In the moderately advanced group, the mortality was much lower. Of the white patients, 8.1 per cent died during the first year and 42.0 per cent were dead by the end of the fifth year following diagnosis. The percentages were higher for the colored, 19.5 the first year and 48.2 by the end of the fifth. The mortality experience of white patients with minimal lesions was low. Only 1.3 per cent of these died the first year after diagnosis and only 8.7 per cent were dead by the end of the fifth year. For the colored, the percentages were 4.5 the first year and 21.6 by the end of the fifth.

To study mortality according to sputum status, the active white cases were classified according to results of sputum examinations made within two months of the date of diagnosis. Since the sputum was positive in only 7 of the minimal cases within that period, subsequent mortality could not be studied. Of the moderately advanced group, 176 had positive sputum and 218 negative sputum at the time of diagnosis. Of the far advanced group, the numbers were 389 and 50, respectively. Table 6 and Figure 2 show the cumulative mortality of the active white cases with moderately advanced and far advanced lesions according to sputum within two months of diagnosis.

The cumulative mortality in moderately advanced cases with positive sputum was much higher than that observed in those with negative sputum. The percentage dead by the end of the first year was 13.7 for those with positive sputum and 7.1 for those with negative sputum. By the end of the fifth year, over half (58.3 per cent) of those with positive sputum had died and slightly less than a fourth (24.3 per cent) of those with negative sputum. Among the patients with far advanced lesions and

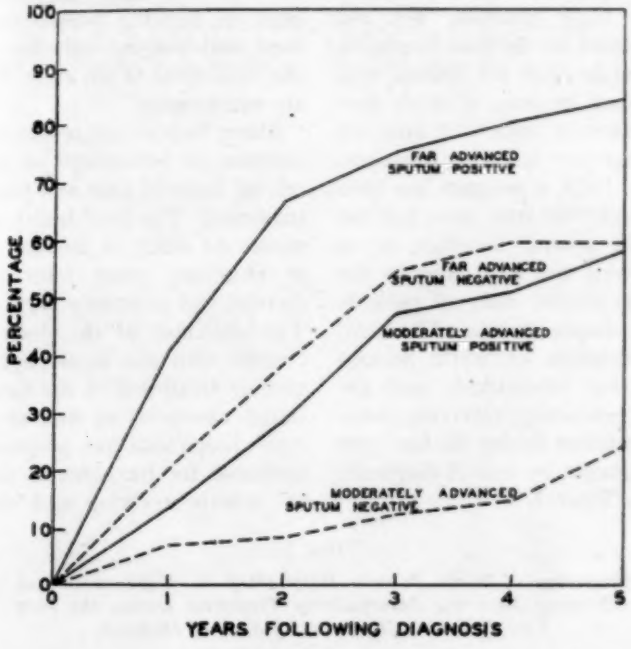
TABLE 6

*Cumulative Mortality, per 100, of Active White Cases with Moderately Advanced and Far Advanced Lesions, According to Sputum on Diagnosis*

| Years Following Diagnosis | Moderately Advanced | | Far Advanced | |
|---|---|---|---|---|
| | Sputum Positive | Sputum Negative | Sputum Positive | Sputum Negative |
| 1st | 13.7 | 7.1 | 41.2 | 20.2 |
| 2nd | 28.5 | 8.5 | 67.0 | 38.6 |
| 3rd | 47.0 | 12.3 | 75.2 | 54.7 |
| 4th | 51.4 | 14.8 | 80.7 | 60.0 |
| 5th | 58.3 | 24.3 | 84.6 | 60.0 |

FIG. 2

CUMULATIVE MORTALITY PER 100 OF ACTIVE WHITE CASES WITH MODERATELY ADVANCED AND FAR ADVANCED LESIONS ACCORDING TO SPUTUM ON DIAGNOSIS




positive sputum the mortality was great, with 41.2 per cent dead by the end of the first year and 84.6 per cent by the end of the fifth. Among those with negative sputum, the percentages were lower, 20.2 and 60.0, respectively. Thus, it is shown that the risk of death is much greater for those with positive sputum at the time of diagnosis than for those with negative sputum, in both moderately and far advanced groups.

Hilleboe[4] has published data regarding survival rates from which cumulative mortality according to extent of lesion and sputum status was obtained for persons discharged from public sanatoria in Minnesota. Mortality rates based on observations from date of discharge from sanatoria exclude many deaths which are included when observation begins with date of diagnosis. The mortality experience of patients discharged with moderately advanced lesions and positive sputum from 12 rural sanatoria in Minnesota was, however, similar to that observed in Tennessee for cases moderately advanced and with positive sputum at the time of diagnosis. By the end of the first year, 17.5 per cent of the Minnesota patients were dead and 13.7 per cent of those in Tennessee; by the end of the fifth year, the percentage dead was 57.8 for Minnesota and 58.3 for Tennessee. Among the patients with far advanced disease and positive sputum, the mortality was greater for those in Tennessee than for those in Minnesota.

### HOSPITALIZATION AND PNEUMOTHORAX TREATMENT

The only county sanatoria in Tennessee are located in the four counties containing large cities, and admit only residents of those counties. For the population served by the field diagnostic units, hospital facilities are limited, with the result that in only a small percentage of cases is such care received during the first year following diagnosis. Since July 1, 1939, a program has been in effect whereby the state pays half the daily rate in general hospitals or in private sanatoria and local agencies the balance to hospitalize indigent patients suitable for collapse therapy. The number and percentage of white persons hospitalized for tuberculosis and the number and percentage receiving pneumothorax treatment during the first year following diagnosis, by year of diagnosis, are shown in Table 7.*

Only 13, or 3.4 per cent, of the 380 white patients diagnosed in 1936 entered a hospital for treatment of tuberculosis within a year of diagnosis. By 1940, however, 60, or 9.6 per cent, received hospital care during the first year following diagnosis. Pneumothorax treatment was stated as being received by only 5 patients diagnosed in 1937; by 1940, this number had increased to 55. In view of the difficulties encountered in securing pneumothorax treatment and hospital care for patients in the rural areas of the state, these results are encouraging.

Many factors are responsible for the increase in percentage of patients receiving hospital care and pneumothorax treatment. The local health officers and nurses do much to interest the patient in obtaining some form of collapse therapy and to arrange ways and means. The clinicians of the diagnostic units consult with the local physicians concerning treatment of the cases. Educational measures, as well as the recent state hospitalization program, are responsible for increases in the numbers of patients receiving such care.

TABLE 7

*Number and Percentage of White Patients Hospitalized for Tuberculosis and Number and Percentage Receiving Pneumothorax Treatment During the First Year Following Diagnosis, by Year of Diagnosis*

| Year of Diagnosis | Total Patients | Hospitalized | | Pneumothorax | |
|---|---|---|---|---|---|
| | | Number | Per cent | Number | Per cent |
| 1936 | 380 | 13 | 3.4 | * | * |
| 1937 | 690 | 27 | 3.9 | 5 | 0.7 |
| 1938 | 615 | 35 | 5.7 | 24 | 3.9 |
| 1939 | 611 | 38 | 6.2 | 33 | 5.4 |
| 1940 | 624 | 60 | 9.6 | 55 | 8.8 |

* Not available

* Data are presented for white cases only since the number of colored cases in which such care was received was too small for discussion. In considering hospitalization, patients who removed from the county to enter a hospital for treatment of tuberculosis have been included, since information concerning their status, etc., was obtained from the family. Persons who removed from observation during the first year are not included in the totals for each year.


### SUMMARY

1. Results of observations of tuberculosis patients followed from a few months to five years from date of diagnosis are presented for 5,056 white and 599 colored cases diagnosed in field clinics in the rural areas of Tennessee.

2. Among patients with active tuberculosis the actual number of deaths from all causes was larger than the number expected. Arrested lesions, however, did not affect mortality appreciably in either the white or the colored group.

3. The risk of death was much greater for patients with positive sputum at the time of diagnosis than for those with negative sputum, in both the moderately advanced and far advanced groups.

4. The percentage of patients hospitalized and the percentage receiving pneumothorax treatment within the first year following diagnosis were small but increased each year.

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# Accuracy of Tuberculosis Death Rates in Williamson County, Tenn.*

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DEATH rates from tuberculosis are known to be very high in many of the southern states.[1, 2, 3] These high rates are in part due to the racial composition of the population since the colored population is largely concentrated in the South and the tuberculosis death rates in the colored population are two or three times the rates in the white population. The rates in the white population are also high in certain southern states with exceedingly high rates in the older age groups. Questions are often raised regarding the accuracy of classification of the cause of death for persons in the older age groups. Do these people actually die from tuberculosis?

The purpose of this report is to compare tuberculosis mortality in Tennessee and the United States and to present an analysis of the data which have been collected regarding tuberculosis deaths officially recorded as such for the 10 year period 1932–1941 for Williamson County, Tennessee. Evidence obtained through clinical and x-ray examination, sputum analysis, and by direct observation is available for over three-fourths of the persons officially recorded as having died from tuberculosis in Williamson County.

## DEMOGRAPHICAL EVIDENCE

In the comparison of tuberculosis mortality, the death rates for the United States for 1939 and for Tennessee for the 3 year period centering in 1939 have been calculated.

The crude white tuberculosis death rate for Tennessee of 60.0 per 100,000 population was 59 per cent higher than the rate of 37.7 for the United States. The difference was even greater when the Tennessee death rate was adjusted for the age distribution of the population of the United States, resulting in a rate of 66.5 per 100,000 population. In the United States as a whole the white male death rate of 44.7 was higher than the white female rate of 30.6, while in Tennessee the opposite was true with the female rate of 62.2 slightly higher than the male rate of 57.8 per 100,000 population. The white female death rate in Tennessee of 68.4, adjusted to the age distribution of the white female population of the United States, was over twice as high as the white female rate of 30.6 for the United States, while the adjusted white male rate in Tennessee of 64.7 was 45 per cent higher than that for the United States. The

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* Presented before the Vital Statistics Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 29, 1942.

This investigation was made possible by the financial support of the International Health Division of the Rockefeller Foundation.

Acknowledgement is made of the valuable suggestions of Dr. J. A. Doull.

TABLE 1

*Tuberculosis Death Rates per 100,000 Population by Age, Sex, and Color for United States, 1939*

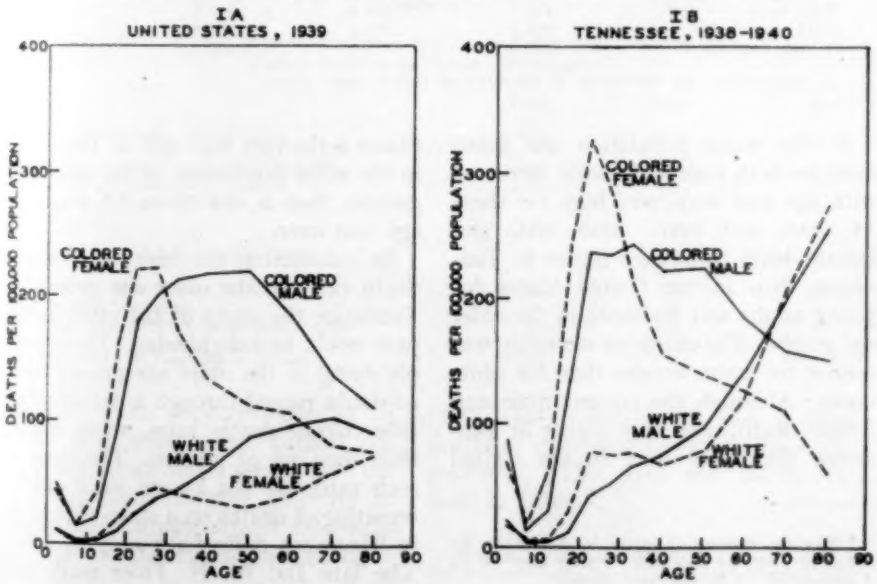
| Age Group | White | | Colored | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| Total | 44.7 | 30.6 | 137.2 | 120.9 |
| Under 5 years | 11.5 | 11.2 | 49.6 | 45.4 |
| 5–9 years | 3.3 | 2.8 | 16.4 | 16.1 |
| 10–14 years | 3.2 | 4.9 | 22.1 | 41.4 |
| 15–19 years | 11.6 | 20.4 | 99.2 | 162.3 |
| 20–24 years | 25.3 | 39.5 | 179.8 | 220.9 |
| 25–29 years | 35.4 | 46.1 | 200.3 | 221.9 |
| 30–34 years | 43.7 | 41.7 | 214.2 | 171.5 |
| 35–44 years | 60.1 | 35.3 | 217.2 | 132.9 |
| 45–54 years | 86.8 | 32.2 | 221.8 | 114.2 |
| 55–64 years | 97.5 | 40.8 | 184.3 | 107.4 |
| 65–74 years | 101.1 | 58.6 | 136.7 | 81.3 |
| 75 years and over | 90.7 | 73.1 | 112.0 | 75.2 |

Tennessee colored tuberculosis death rate of 159.3, adjusted to the age distribution of the colored population of the United States, was only 24 per cent higher than the rate of 128.9 for the United States. Therefore, it is evident that the excessive tuberculosis mortality in Tennessee is chiefly in the white population, with a greater excess among females.

To show the age groups of excessive mortality, the death rates have been calculated by age, sex, and color. In Table 1 and Chart I-A are given these rates for the United States.

The white male tuberculosis death rates increased with age to the high rate of 101.1 per 100,000 population for those 65–74 years of age while the female rates were high for young adults 20–34

TUBERCULOSIS DEATH RATES PER 100,000 POPULATION
BY AGE, SEX AND COLOR FOR UNITED STATES AND TENNESSEE



years, followed by a slight decrease for females 35–54 years, with an increase to the rate of 73.1 for females 75 years and over. Among colored males the rates were high for young adults and continued high with a decline for colored males 55 years and over. Very high rates were recorded for young colored females 20–29 years of age followed by lower rates in the older age groups.

The tuberculosis death rates are given in Table 2 and Chart I-B for Tennessee for the 3 year period * 1938–1940.

States, the distributions of these rates, by age, were similar.

On subdivision of these data for Tennessee by urban and rural areas it was found that the white tuberculosis death rate in the rural area was higher than the rate in the urban area, with a marked excess in the older age group. The colored tuberculosis rate, however, was higher in the urban area than in the rural area.[4]

Without doubt the outstanding feature in the comparison of mortality from tuberculosis in Tennessee and the United

TABLE 2

*Average Annual Tuberculosis Death Rates per 100,000 Population by Age, Sex and Color for Tennessee, 1938–1940*

| | White | | Colored | |
|---|---|---|---|---|
| *Age Group* | *Male* | *Female* | *Male* | *Female* |
| Total—Crude Rates | 57.8 | 62.2 | 160.9 | 164.8 |
| Total—Adjusted Rates* | 64.7 | 68.4 | 157.4 | 161.2 |
| Under 5 years | 22.4 | 19.4 | 86.6 | 69.3 |
| 5– 9 years | 3.9 | 4.8 | 14.2 | 21.3 |
| 10–14 years | 5.1 | 5.8 | 30.3 | 65.6 |
| 15–19 years | 13.1 | 29.3 | 134.7 | 242.2 |
| 20–24 years | 41.3 | 75.5 | 236.7 | 328.0 |
| 25–29 years | 51.0 | 74.2 | 235.6 | 282.5 |
| 30–34 years | 64.8 | 75.6 | 244.1 | 213.9 |
| 35–44 years | 74.4 | 66.7 | 222.1 | 156.7 |
| 45–54 years | 95.9 | 78.8 | 226.1 | 140.1 |
| 55–64 years | 140.7 | 119.6 | 182.7 | 125.0 |
| 65–74 years | 199.4 | 204.2 | 158.9 | 111.3 |
| 75 years and over | 255.5 | 275.6 | 150.7 | 60.3 |

* Adjusted for age distribution of population of United States, 1939

In the white population the death rates for both male and female increased with age and were very high for those 55 years and over. Both male and female death rates were higher in Tennessee than in the United States for young adults and for those in the older age groups. The excessive mortality was greater for white females than for white males. Although the colored male and female death rates were higher in Tennessee than they were in the United States is the very high rate in Tennessee in the white population in the older age groups, that is, for those 55 years of age and over.

In considering the high tuberculosis death rates in the older age groups in Tennessee the study of the rates in the past would be enlightening. These people dying in the older age groups have no doubt passed through a period when tuberculosis death rates were higher than they are at present. The sizes of such rates are not known since official reporting of deaths on a state-wide basis in Tennessee dates back only to 1914. The late Dr. W. H. Frost made the

* Since the numbers of deaths in the various age groups in Tennessee were small, average rates for the 3 year period, 1938–1940, were obtained.

TABLE 3

*Tuberculosis Deaths with Average Annual Tuberculosis Death Rates per 100,000 Population by Color for Williamson County, Tenn., for 1932–1941*

| | Total | | White | | Colored | |
|---|---|---|---|---|---|---|
| | Deaths | Av. Annual Rate | Deaths | Av. Annual Rate | Deaths | Av. Annual Rate |
| Total | 214 | 87.5 | 119 | 62.8 | 95 | 172.4 |
| 1932–1936 | 118 | 98.9 | 63 | 68.4 | 55 | 202.8 |
| 1937–1941 | 96 | 76.7 | 56 | 57.6 | 40 | 142.9 |

following statements[5] regarding the relatively high mortality rates in the older age groups:

> Viewed in this light the relatively high mortality rates now exhibited in the higher age groups seem to me to have a significance quite different from what I had attributed to them. They may be interpreted as the residuum of the much higher rates which the now aged cohorts have experienced in earlier life. In general, the rule seems to be that the higher the mortality of any cohort in early life, the higher will it be in later years. Or, to have passed through a period of high mortality risk confers not protection, but added hazard in late life.

Study of the tuberculosis deaths reported since the beginning of the Williamson County Tuberculosis Study in December, 1931, especially deaths of patients who were under clinical observation prior to death, should give the best information available to prove or disprove the accuracy of these extremely high rates in the rural population of Tennessee.

During the 10 year period, 1932–1941, 214 tuberculosis deaths have been recorded for Williamson County.* The average tuberculosis death rate for this period was 87.5 per 100,000 population with the colored rate of 172.4 nearly three times the white rate of 62.8.

A slight decrease has been noted in both white and colored death rates as shown in Table 3.

Of the 214 tuberculosis deaths recorded for Williamson County, 140 were deaths of persons followed in the study who were known to have died from tuberculosis, 47 were believed to be tuberculosis deaths upon investigation, 23 were considered deaths from causes other than tuberculosis, and 4 were deaths of persons unknown to the study personnel. The data are shown by color in Table 4.

TABLE 4

*Tuberculosis Deaths as Recorded and Additional Tuberculosis Deaths by Color, Williamson County, Tenn., 1932–1941*

| | Total | White | Colored |
|---|---|---|---|
| Official Tuberculosis Deaths—Total | 214 | 119 | 95 |
| In Study Group—Tuberculosis Deaths | 140 | 80 | 60 |
| Considered Tuberculosis Deaths | 47 | 22 | 25 |
| Considered Non-Tuberculosis Deaths | 23 | 15 | 8 |
| Unknown | 4 | 2 | 2 |
| Additional Tuberculosis Deaths—Total | 33 | 17 | 16 |
| Death Certificates Stated Other Causes | 18 | 7 | 11 |
| No Death Certificate | 8 | 4 | 4 |
| Death Certificates for Other Area or Late | 7 | 6 | 1 |
| Total Considered Tuberculosis Deaths | 220 | 119 | 101 |

* Resident data from the *Annual Vital Statistics Bulletins* were used for 1933–1941 and recorded data for 1932.

TABLE 5

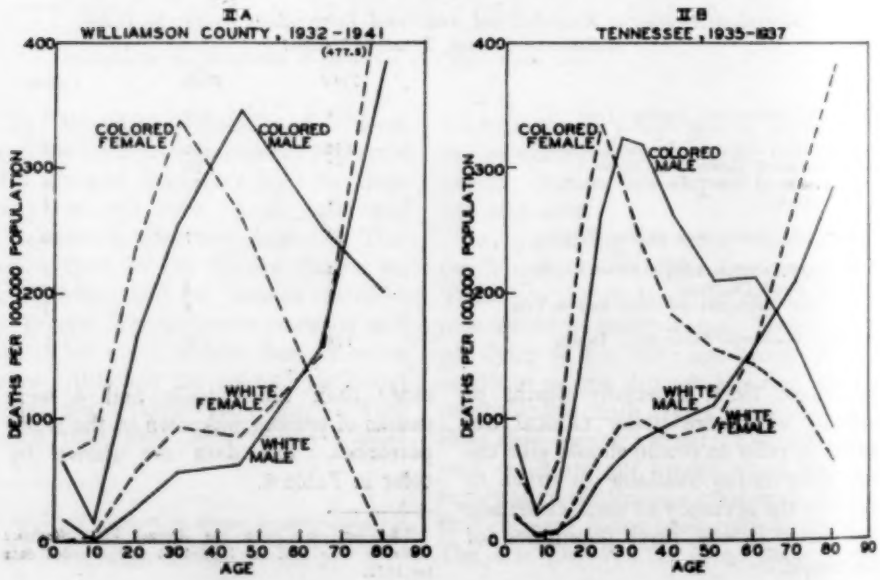
*Deaths Considered Caused by Tuberculosis with Average Annual Rates per 100,000 Population by Age, Sex and Color, Williamson County, Tenn., 1932–1941*

| Age Group | White Male | | White Female | | Colored Male | | Colored Female | |
|---|---|---|---|---|---|---|---|---|
| | Deaths | Average Rate | Deaths | Average Rate | Deaths | Average Rate | Deaths | Average Rate |
| Total | 53 | 55.0 | 66 | 71.0 | 49 | 177.6 | 52 | 188.9 |
| Under 5 years | 2 | 19.6 | .. | .... | 2 | 65.7 | 2 | 69.3 |
| 5–14 years | .. | .... | 1 | 4.9 | 1 | 16.1 | 5 | 81.6 |
| 15–24 years | 5 | 27.4 | 10 | 57.5 | 9 | 163.5 | 13 | 235.9 |
| 25–34 years | 7 | 55.6 | 12 | 92.7 | 10 | 254.5 | 14 | 337.8 |
| 35–54 years | 12 | 62.4 | 17 | 84.9 | 18 | 346.2 | 15 | 262.9 |
| 55–74 years | 20 | 156.8 | 17 | 150.0 | 8 | 250.4 | 3 | 113.0 |
| 75 years and over | 7 | 383.6 | 9 | 477.5 | 1 | 200.0 | .. | ..... |

In addition to these 214 deaths recorded as tuberculosis, 33 other patients with active tuberculosis were followed in the study and were known to have died from the disease. The causes of deaths for 18 of these patients were stated to be other than tuberculosis on death certificates, no death certificate was recorded for 8, and death certificates were filed for other areas with the residence stated incorrectly or were filed late for 7. When these additional tuberculosis deaths, 33, were added to the number of deaths officially recorded as tuberculosis and considered so by the study, 187, the total number of deaths considered caused by tuberculosis was 220. This number is practically the same as the number officially recorded as tuberculosis deaths due to the subtraction of 27 and addition of 33. Thus in considering the number of the tuberculosis deaths in Williamson County, it appears to be approximately the same as the number officially recorded.

These 220 deaths considered caused

TUBERCULOSIS DEATH RATES PER 100,000 POPULATION BY AGE, SEX AND COLOR FOR WILLIAMSON COUNTY AND TENNESSEE



by tuberculosis will be used in the following discussion. The average tuberculosis death rates by age, sex, and color have been calculated to compare with the rates in Tennessee. The data for this 10 year period for Williamson County are given in Table 5.

In Chart II these rates are shown graphically with average data for Tennessee for the 3 year period, 1935–1937, for comparison. With the small number of deaths involved for Williamson County for some of these age groups, the consistency of Williamson County rates with those in Tennessee seems noteworthy. The death rates in the white population in the older age groups are high in Williamson County as they are in Tennessee, with the female death rate higher than the male death rate. Therefore, the tuberculosis death rates by age, sex, and color in Williamson County are found to be essentially in agreement with those in Tennessee.

### CLINICAL EVIDENCE

Of the 220 deaths considered attributable to tuberculosis, 173 were of patients followed in the study. The remaining 47 deaths were investigated after death with inquiry regarding symptoms and duration of illness. It is possible, therefore, to give additional data regarding the nature and evidence of the disease for the 173 persons followed in the study.

Diagnoses of tuberculosis have usually been established by physical and x-ray examinations. Suspected cases of tuberculosis have been referred to the clinic by the private physicians of the county and the diagnoses have been made by the study clinician. Whenever the patient has been too ill to be brought to the clinic an examination has been made in the home. If electric current was available, portable equipment was taken to the home so that the x-ray might be made. In a few cases the clinician has gone to the home with the private physician to examine a very sick patient. Following initial examination, nursing visits and periodic examinations have been made according to the recommendations of the clinician.

In Table 6 are given the numbers of diagnoses established by x-ray examination by age group and color.

Diagnoses of 86 per cent of the white and 92 per cent of the colored cases were established by x-ray examination. Of the 14 white patients without x-ray examination, 10 submitted sputa which were positive. Three of the other 4 had far advanced bilateral tuberculosis and died within a few months after examination. The 4th was a bed patient with moderately advanced tuberculosis and died 2 weeks after examination.

Of the 6 colored patients without x-ray examination 4 had positive sputa and the other 2 had far advanced bilateral tuberculosis, and both died within 1 month after examination.

TABLE 6

*Diagnoses Established by X-ray Examination for 173 Patients Dying from Tuberculosis, by Age and Color, Williamson County, Tenn., 1932–1941*

| Age Group | White | | | Colored | | |
|---|---|---|---|---|---|---|
| | Diagnoses Established by X-ray Examination | | | Diagnoses Established by X-ray Examination | | |
| | Total | Number | Per cent | Total | Number | Per cent |
| Total | 97 | 83 | 86 | 76 | 70 | 92 |
| Under 15 years | 3 | 3 | 100 | 9 | 9 | 100 |
| 15–34 years | 32 | 28 | 88 | 36 | 33 | 92 |
| 35–54 years | 24 | 21 | 88 | 24 | 22 | 92 |
| 55 years and over | 38 | 31 | 82 | 7 | 6 | 86 |

The 97 white patients were given 255 x-ray examinations and 51 physical examinations in the home so that they had on the average 3.2 examinations. Each of the 76 colored patients had an average of 2.6 examinations.

In studying duration of the disease, the length of time from onset of the disease as manifest by symptoms to death has been obtained for each patient. The average years from onset of first symptoms to death from the disease according to age and sex of white persons dying from tuberculosis are given in Table 7.

TABLE 7

*Average Years from Onset to Death of White Persons Dying from Tuberculosis, by Age Group and Sex, Williamson County, Tenn., 1932–1941*

| | Total | | Male | | Female | |
|---|---|---|---|---|---|---|
| *Age Group* | *Number* | *Average Years from Onset to Death* | *Number* | *Average Years from Onset to Death* | *Number* | *Average Years from Onset to Death* |
| Total | 97 | 8.7 | 43 | 9.0 | 54 | 8.5 |
| Under 15 years | 3 | 1.0 | 2 | 0.4 | 1 | 2.0 |
| 15–34 years | 32 | 2.7 | 11 | 3.1 | 21 | 2.5 |
| 35–54 years | 24 | 9.3 | 10 | 10.6 | 14 | 8.4 |
| 55 years and over | 38 | 14.0 | 20 | 12.4 | 18 | 15.8 |

The average period of time for white persons dying from tuberculosis, that is, from onset to death, was 8.7 years. For those 55 years of age and over, the average period, 14.0 years, was longer than for the younger adults. The length of time from onset to death for colored persons (1.8 years) as shown in Table 8 was approximately one-fifth that for white persons. Among the colored, the period from onset to death was 2.3 years for the male and 1.6 for the female. The longer period of time from onset to death for colored males than for females is consistent with the tuberculosis death rates which indicate that males dying from tuberculosis live longer than do females.

Of the 38 white persons in the older age group (55 years and over), 11 were 55–64 years, 18 were 65–74 years, and 9 were 75 years of age or over. It should be pointed out that this large number of old people with the disease over relatively long periods of time may play an important part in keeping the tuberculosis death rates high in Tennessee. These old people have the disease many years and are not sufficiently disabled to be bedridden. Some of them live in several households with sons and daughters and grandchildren. Therefore, over a long period of time

TABLE 8

*Average Years from Onset to Death of Colored Persons Dying from Tuberculosis by Age Group and Sex, Williamson County, Tenn., 1932–1941*

| | Total | | Male | | Female | |
|---|---|---|---|---|---|---|
| *Age Group* | *Number* | *Average Years from Onset to Death* | *Number* | *Average Years from Onset to Death* | *Number* | *Average Years from Onset to Death* |
| Total | 76 | 1.8 | 36 | 2.3 | 40 | 1.6 |
| Under 15 years | 9 | 0.5 | 3 | 0.3 | 6 | 0.6 |
| 15–34 years | 36 | 1.2 | 15 | 1.0 | 21 | 1.4 |
| 35–54 years | 24 | 3.0 | 12 | 4.8 | 12 | 1.3 |
| 55 years and over | 7 | 3.5 | 6 | 1.6 | 1 | 15.1 |

the disease may be spread by them to many young people. Some of the young susceptible individuals in contact with parents or grandparents with tubercle bacilli in the sputum break down with the disease and die from tuberculosis while others are resistant and the tuberculous process becomes arrested. Cases of this second type may break down many years later. An example in which the grandmother in the family had chronic tuberculosis with little disability is given as an illustration.

The head of the family, a white male, age 38, with symptoms of tuberculosis, was referred to the study by his private physician. On x-ray examination he was found to have far advanced tuberculosis with tubercle bacilli in the sputum. This man died 2 years and 5 months later of tuberculosis. On examination of other members of the family, his mother, age 77 years, was found to have far advanced tuberculosis. Tubercle bacilli could not be isolated from the five specimens of her sputum submitted. According to the history obtained, this woman had a prolonged cough for 1 year with expectoration in the morning, about 50 years prior to examination. Although she had symptoms and physical signs of tuberculosis at the time of examination, she was only slightly disabled. She died 3 years and 4 months later from tuberculosis. The daughter of the head of the family who was 14 years of age was also found to have moderately advanced tuberculosis with tubercle bacilli in the sputum and she died one year and one month later. In addition, another son of the grandmother in the family died from tuberculosis in 1913, age 22 years. Thus this old lady lived for many years probably expectorating tubercle bacilli occasionally which, in turn, caused new cases and deaths in the family. These 3 additional cases and deaths occurred in a period of 23 years.

### BACTERIOLOGICAL EVIDENCE

Another evidence of tuberculous disease among these patients carried prior to death was obtained through sputum analyses. The results of such examinations are given in Table 9.

TABLE 9

*Results of Sputum Analysis for 173 Patients Dying from Tuberculosis by Color and Age, Williamson County, Tenn., 1932–1941*

| Age Group | Total | | | | White | | | | Colored | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Sputum Pos. | Sputum Neg. | Unknown | Total | Sputum Pos. | Sputum Neg. | Unknown | Total | Sputum Pos. | Sputum Neg. | Unknown |
| Total | 173 | 132 | 18 | 23 | 97 | 79 | 9 | 9 | 76 | 53 | 9 | 14 |
| Under 15 years | 12 | 4 | 2 | 6 | 3 | 1 | .. | 2 | 9 | 3 | 2 | 4 |
| 15–34 years | 68 | 56 | 5 | 7 | 32 | 30 | 1 | 1 | 36 | 26 | 4 | 6 |
| 35–54 years | 48 | 41 | 2 | 5 | 24 | 22 | .. | 2 | 24 | 19 | 2 | 3 |
| 55 years and over | 45 | 31 | 9 | 5 | 38 | 26 | 8 | 4 | 7 | 5 | 1 | 1 |

Of the 173 patients who died from tuberculosis and were followed in the study, 132, or 76 per cent, were known to have been discharging tubercle bacilli. For all adult age groups, the proportions of these persons found to have tubercle bacilli in the sputum were high and this is confirmatory evidence of tuberculous disease. For 23 patients, specimens could not be obtained and for 18 the specimens submitted were negative for tubercle bacilli.

Some of these persons, with tuberculosis over a long period of time, especially in the higher age groups, were known to have tubercle bacilli in their sputum for many years. An example

of such a case was a white male, 66 years of age on examination, who was found to have far advanced tuberculosis with cavitation. The onset of the disease occurred 3 years prior to examination. His condition remained practically the same for 6 years. Sputum analyses were made on 56 occasions and all were positive. During most of this time he felt well and was able to be up every day. He died from the disease 9 years after onset of first symptoms.

Although 31 of the 45 patients in the older age group (55 years and over) were found to have tubercle bacilli in their sputa, specimens submitted on two or more occasions for 9 were negative. No doubt through examination of additional specimens of these patients, tubercle bacilli would have been isolated for a few.* Of these 9, 8 were white females who were known to have had the disease for 20 years, on the average. Their average age at death was 73 years. Five had far advanced and 4 moderately advanced tuberculosis on x-ray examination and very little disability. Clinical and x-ray examination showed that these people had active disease which caused death. An illustration of this type of case is the grandmother in the white family discussed previously. Only one specimen was obtained at the time of death and four others were obtained 1–4 years prior to death. Examination revealed strand-like infiltration throughout the entire right lung with bronchiectasis in the base, also strand-like infiltration in the circle of the first rib in the left lung with calcium in both lungs. Pulmonary symptoms became worse for the last few months prior to death and her death was attributed to tuberculosis.

These sputum findings offer additional evidence of the accuracy of the classification of the causes of death as tuberculosis.

* Sputum of one of the females with far advanced tuberculosis who had 10 negative sputum examinations in the study was examined by Dr. B. J. Olson of the National Institute of Health. Although the smear and culture were negative, 1 out of 4 animals inoculated with undigested sputum showed evidence of the disease on autopsy. This sputum was examined 3 months prior to death and 3 months after the last sputum examination in the study.

## SUMMARY

1. The tuberculosis death rates for Tennessee have been compared with those in the United States. The outstanding feature of the difference was the very high rates in Tennessee in the white population in the older age groups, that is, for those 55 years of age and over.

2. During the 10 year period 1932–1941, 214 tuberculosis deaths were recorded in Williamson County. This number of officially recorded deaths appears to be practically the same as the total number of deaths, 220, considered upon investigation as due to tuberculosis.

3. On studying the Williamson County tuberculosis death rates by age, sex, and color, the rates were found to be essentially in agreement with those in Tennessee with high rates in the white population in the older age groups.

4. Diagnoses have usually been established by x-ray, with 86 per cent of the diagnoses of the white and 92 per cent of the colored patients dying from tuberculosis established in this way.

5. The duration of the disease, from onset of first symptoms to death, was 8.7 years for the white patients followed in the study and 1.8 years for the colored patients.

6. For these patients who died from tuberculosis and were carried in the study, 76 per cent were known to have been discharging tubercle bacilli prior to death. This was additional evidence of the accuracy of the classification of the causes of death as tuberculosis.

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# Prevalence and Incidence of Tuberculosis among Household Associates According to Age and Sex of Index Case*

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THE occurrence of manifest tuberculosis in household associates of sputum-positive or presumably sputum-positive index cases and in associates of cases other than sputum-positive in Williamson County, Tenn., has been previously reported.[1, 2, 3] In none of these reports was there any division of material according to the sex and age of the index case. It seems likely that these factors are of importance in determining the risk of development of manifest tuberculosis in household associates. The age at which tuberculosis develops may influence the type of disease and the rapidity of its course; these in turn may affect materially the extent and the duration of the exposure to which associates are subjected. Exposure may be affected also by varying intimacy of contact, since, for example, the relationship between young children and their parents is in general closer than between such children and their grandparents.

If the age of the index case is a significant factor, Tennessee data should be of especial interest. From age-specific tuberculosis death rates it has been learned that Tennessee, in the white portion of its population, presents a picture quite different from that of the United States in two respects:

1. In the older ages the rates for Tennessee have been much higher for both sexes.
2. In these older ages the rates for females have been higher than for males while in the United States the rates for males have been higher than for females.

In certain acute diseases there are peculiarities of secondary attack rates which may be attributable to the age of the primary case. In diphtheria, for example, studies of familial incidence show higher attack rates among adolescent and younger adult females than among males of comparable ages.[4]

It should be remembered that the index case is not necessarily the first case in the household. Not infrequently cases found as a result of examination of household associates give histories of onset of illness which antedate that of the index cases, sometimes by many years. Usually, however, the index case is the first recognized case in the household.

* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 28, 1942.

This investigation was made possible by the financial support of the International Health Division of the Rockefeller Foundation.

Acknowledgment is made of the valuable suggestions made by Dr. J. A. Doull in the preparation of this report.

With these facts in mind prevalence and incidence of tuberculous lesions have been studied according to the age and sex distribution both of index cases and of household associates. The practical questions on which it is hoped eventually to throw light may be expressed as follows: (a) Does age and sex of the index case affect the prevalence of tuberculosis among household associates at the time the household comes to the attention of the health department? (b) Does age and sex of the index case affect significantly the incidence of tuberculosis among household associates in subsequent years?

### NUMBERS OF INDEX CASES AND ASSOCIATES

From the beginning of the intensive study of tuberculosis in Williamson County late in 1931 through December 31, 1940, 536 white individuals with some form of reinfection tuberculosis have been designated as index cases in white households. These 536 white index cases and their household associates form the basis for the present analysis. A diagnosis of manifest tuberculosis is based upon evidence of tuberculosis recognizable by history or physical examination. The cases of manifest tuberculosis have been divided in two groups:

1. "Sputum-positive," including those with tubercle bacilli demonstrated on two or more occasions by staining untreated sputum, those fatal before investigation and those with insufficient or no sputum analysis dying shortly after observation was commenced.

2. "Other manifest," including those sputum-negative on two or more examinations, and those with insufficient or no sputum analysis not falling in the first group with respect to death.

Those with apical lesions demonstrable by x-ray, but without associated physical signs, symptoms, or history which would lead to the diagnosis of tuberculosis in the absence of x-ray examination were classed as "latent apical."

In the classification of findings in household associates, the same criteria have been used as for the index cases. Those with no evidence of reinfection tuberculosis have been classed in two groups:

1. Primary tuberculosis, including those who, on x-ray examination, show nothing more than a lesion of the primary or first infection type, with no signs or symptoms of tuberculous disease.

2. Negative, including those who, on physical and x-ray examination show no signs of tuberculosis, but not necessarily a negative tuberculin reaction.

The distribution of index cases by type, sex and broad age groups is shown in Table 1.

Of 536 index cases, 322, or 60 per cent, were females. For all types, this excess of females was most striking in those under 35 years of age, but it is evident also in those of 35 to 54 years of age. In the oldest age group, 55 years and over, the numbers of males and females are approximately equal. It is of special interest that of 46

TABLE 1

*Index Cases by Age, Sex and Type*

| | *Total* | | | *Sputum-Positive and Fatal* | | | *Other Manifest* | | | *Latent Apical* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Total* | *Male* | *Female* | *Total* | *Male* | *Female* | *Total* | *Male* | *Female* | *Total* | *Male* | *Female* |
| **Total** | 536 | 214 | 322 | 138 | 60 | 78 | 316 | 122 | 194 | 82 | 32 | 50 |
| **Under 35 years** | 157 | 45 | 112 | 57 | 17 | 40 | 76 | 20 | 56 | 24 | 8 | 16 |
| **35–54 years** | 203 | 80 | 123 | 35 | 13 | 22 | 128 | 53 | 75 | 40 | 14 | 26 |
| **55 years and over** | 176 | 89 | 87 | 46 | 30 | 16 | 112 | 49 | 63 | 18 | 10 | 8 |

sputum-positive or fatal index cases in persons 55 years of age and over, 30, or 65 per cent, were males.

The higher mortality among females in the older ages has already been mentioned. This has been a feature of tuberculosis mortality of this state in every year since data have become available but this disparity between the sexes has not been so apparent in recent years. At ages under 35 years, the death rates for females have continued to remain substantially higher than those for males. This is, however, an almost universal feature of mortality from tuberculosis. In Tennessee as a whole, judging from response to the field diagnostic service of the Division of Tuberculosis Control, females are more likely to report to physicians or clinics for chest examination and to report sooner after appearance of symptoms than males. Males are more apt to disregard symptoms and delay examination. It is, therefore, not surprising to find an excess of females among index cases in Williamson County.

## SEX AND AGE DISTRIBUTION OF INDEX CASES AND OF CASES FOUND AMONG HOUSEHOLD ASSOCIATES

It is of some interest to compare the sex and age distribution of index cases with those cases found as the result of examination of household associates of index cases. There were 74 manifest cases and 63 latent apical cases of tuberculosis in the latter group and the comparison is shown in Table 2.

TABLE 2

*Index Cases and Other Cases Found on Investigation by Age and Sex*

| | *Manifest* | | | | | | *Latent Apical* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Total* | | *Male* | | *Female* | | *Total* | | *Male* | | *Female* | |
| | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* |
| | | | | | | *Index Cases* | | | | | | |
| Total | 454 | 100.0 | 182 | 100.0 | 272 | 100.0 | 82 | 100.1 | 32 | 100.0 | 50 | 100.0 |
| Under 35 years | 133 | 29.3 | 37 | 20.3 | 96 | 35.3 | 24 | 29.3 | 8 | 25.0 | 16 | 32.0 |
| 35–54 years | 163 | 35.9 | 66 | 36.3 | 97 | 35.7 | 40 | 48.8 | 14 | 43.8 | 26 | 52.0 |
| 55 years and over | 158 | 34.8 | 79 | 43.4 | 79 | 29.0 | 18 | 22.0 | 10 | 31.2 | 8 | 16.0 |
| | | | | | | *Other Cases* | | | | | | |
| Total | 74 | 100.0 | 30 | 100.0 | 44 | 100.0 | 63 | 100.0 | 29 | 99.9 | 34 | 100.0 |
| Under 35 years | 16 | 21.6 | 7 | 23.3 | 9 | 20.5 | 23 | 36.5 | 11 | 37.9 | 12 | 35.3 |
| 35–54 years | 25 | 33.8 | 8 | 26.7 | 17 | 38.6 | 30 | 47.6 | 13 | 44.8 | 17 | 50.0 |
| 55 years and over | 33 | 44.6 | 15 | 50.0 | 18 | 40.9 | 10 | 15.9 | 5 | 17.2 | 5 | 14.7 |

These added cases of manifest tuberculosis had a slightly greater proportion in the age group 55 years or over than the index cases. The added latent apical cases had a somewhat different age distribution, with proportionately a larger number at ages less than 35 years.

The sex distribution of these added cases was quite similar to that of the index cases, 57 per cent being females.

## PREVALENCE OF TUBERCULOSIS IN HOUSEHOLD ASSOCIATES

In Williamson County, as in the state as a whole, it has been possible to examine a larger proportion of female household associates than of male associates. For a variety of reasons females report to the family physicians or to the clinic more promptly and, in a greater proportion of instances, after an examination has been recommended than do males. A difference in the sense of economic pressure is probably of importance, and it is also likely that nurses are able to impress on females the advisability of examination to a

greater extent because most of the home conversations of the nurse are with the females of the household. The approach of the nurse is, therefore, more likely to be direct in dealing with females than is the case with males.

In determining the prevalence of tuberculous lesions among household associates according to type, sex, and age of the index case an adjustment for age was found to be advisable. The prevalence rates of tuberculous lesions shown in Tables 3 and 4 have been adjusted to the age distribution of all household associates.

*Prevalence according to age of index case*—Table 3 shows the prevalence of tuberculous lesions by sex among household associates according to age group and classification of the index case. Among household associates of sputum-positive index cases no significant variation in prevalence of manifest disease was associated with differences in age. For associates of index cases under 55 years of age the prevalence rate was 6.7 per cent, and for associates of older index cases it was 6.3 per cent. For the other than sputum-positive group there was an apparently higher rate, 3.3 per cent, when the index cases were under 55 years of age, than when they were older, 1.2 per cent, but the difference may have been a fortuitous one.

Of male associates of sputum-positive cases under 55 years of age, 6.4 per cent were found to have manifest tuberculosis, and of the comparable female associates, 7.2 per cent. A wider difference, however, was found among associates of this type of index case older than 55 years. Of the males the proportion found to have manifest tuberculosis was 2.4 per cent and of the females, 8.7 per cent. From this it is suggested that, among associates of older index cases of the sputum-positive class, tuberculosis was much more frequently found in females than in males, whereas in the households of younger index cases, there was little difference between the prevalence rates for males and females.

This higher proportion of females showing manifest tuberculosis was seen also in household associates of the older index cases other than sputum-positive. The proportion of male associates of this type of index case under 55 years of age found to have manifest tuberculosis was 3.0 per cent, and for females the proportion was 3.7 per cent. Among associates of this type of index case 55 years of age or over, 0.3 per cent of

TABLE 3

*Prevalence* of Tuberculosis of Various Types by Sex Among Household Associates According to Age Group and Classification of Index Case*

| | Total | | | Index Case Under 55 Years | | | Index Case 55 Years and Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Male | Female | Total | Male | Female | Total | Male | Female |
| | *Associates of Sputum-Positive Index Cases* | | | | | | | | |
| Total | 100.0 | 99.9 | 100.1 | 100.1 | 100.0 | 100.0 | 100.1 | 99.9 | 100.1 |
| Manifest | 6.6 | 5.1 | 8.2 | 6.7 | 6.4 | 7.2 | 6.3 | 2.4 | 8.7 |
| Latent Apical | 7.9 | 8.9 | 6.9 | 6.3 | 7.8 | 4.9 | 11.4 | 10.8 | 12.5 |
| Primary | 65.8 | 61.0 | 70.7 | 70.2 | 66.0 | 74.8 | 55.2 | 47.7 | 62.8 |
| Negative | 19.7 | 24.9 | 14.2 | 16.9 | 19.8 | 13.1 | 27.2 | 39.0 | 16.1 |
| | *Associates of Other Than Sputum-Positive Index Cases* | | | | | | | | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.1 | 100.0 | 100.1 |
| Manifest | 2.4 | 2.0 | 3.0 | 3.3 | 3.0 | 3.7 | 1.2 | 0.3 | 1.9 |
| Latent Apical | 7.4 | 6.6 | 8.5 | 8.1 | 7.4 | 8.9 | 7.4 | 3.6 | 8.3 |
| Primary | 57.3 | 56.3 | 57.7 | 58.0 | 59.3 | 57.5 | 53.2 | 49.8 | 56.6 |
| Negative | 32.9 | 35.1 | 30.8 | 30.6 | 30.3 | 29.9 | 38.3 | 46.3 | 33.3 |

* Adjusted to age distribution of all household associates

TABLE 4

*Prevalence* of Tuberculosis of Various Types by Sex Among Household Associates According to Sex and Classification of Index Case*

| | Total | | | Index Case Male † | | | Index Case Female † | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Male | Female | Total | Male | Female | Total | Male | Female |
| | *Associates of Sputum-Positive Index Cases* | | | | | | | | |
| Total | 100.0 | 99.9 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.1 |
| Manifest | 6.6 | 5.1 | 8.2 | 8.5 | 7.5 | 9.7 | 5.1 | 3.4 | 6.5 |
| Latent Apical | 7.9 | 8.9 | 6.9 | 8.5 | 8.9 | 8.6 | 7.2 | 9.1 | 5.4 |
| Primary | 65.8 | 61.0 | 70.7 | 62.6 | 59.9 | 67.2 | 67.9 | 58.6 | 76.6 |
| Negative | 19.7 | 24.9 | 14.2 | 20.4 | 23.7 | 14.5 | 19.8 | 28.9 | 11.6 |
| | *Associates of Other Than Sputum-Positive Index Cases* | | | | | | | | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.1 | 100.0 | 100.0 | 100.0 | 100.0 |
| Manifest | 2.4 | 2.0 | 3.0 | 2.2 | 2.6 | 2.5 | 2.5 | 2.0 | 4.1 |
| Latent Apical | 7.4 | 6.6 | 8.5 | 7.8 | 10.2 | 6.9 | 7.0 | 5.3 | 9.7 |
| Primary | 57.3 | 56.3 | 57.7 | 57.6 | 57.2 | 58.2 | 57.0 | 58.0 | 55.5 |
| Negative | 32.9 | 35.1 | 30.8 | 32.4 | 30.1 | 32.4 | 33.5 | 34.7 | 30.7 |

* Adjusted to age distribution of all household associates.

† Average age of male sputum-positive index cases is 51 ± 19, female 39 ± 17; average age of male other than sputum-positive index cases is 48 ± 16, female 44 ± 16.

males, and 1.9 per cent of females were found to have manifest tuberculosis.

The proportions of associates found to be negative for any type of tuberculous lesion on x-ray examination when compared by sex are the reverse of those noted to have manifest tuberculosis. In each class a smaller proportion of females was negative.

Although prevalence rates of manifest tuberculosis were approximately the same in the two groups of associates of sputum-positive index cases when comparison is made by age of the index case, the proportion of associates of the older index cases with no evidence of tuberculous infection was higher than for associates of index cases of younger ages (27.2 per cent and 16.9 per cent). This difference may be attributable to lesser intimacy of contact between older cases and others in the household, especially children.

*Prevalence according to sex of index case*—The prevalence of tuberculosis lesions of various types among associates according to type and sex of the index case is shown in Table 4.

In the sputum-positive type, the associates of male index cases had an apparently higher prevalence rate (8.5 per cent) than had associates of female index cases (5.1 per cent). The associates of other than sputum-positive index cases showed no significant difference related to the sex of the index case. Also the proportions escaping infection, as judged from x-ray examinations, were approximately the same regardless of the sex of the index case.

It is also of interest that when the index case was male the prevalence rate for males (7.5 per cent) was not widely different from that for females (9.7 per cent). But when the index case was female the rate for males (3.4 per cent) was lower than that for females (6.5 per cent).

## INCIDENCE OF NEW CASES OF TUBERCULOSIS

The incidence of new cases, by sex, during the period of observation, is shown in Tables 5 and 6.

*Incidence according to age of index case*—The first division of the material is according to type and age of the index case and is given in Table 5. Among household associates of sputum-positive index cases under 55 years of age the

TABLE 5

*New Cases of Tuberculosis by Sex with Rates per 1,000 Among Household Associates According to Age Group and Classification of Index Case*

| | Total | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Person-Years | New Cases | | Person-Years | New Cases | | Person-Years | New Cases | |
| | | Number | Rate | | Number | Rate | | Number | Rate |
| | *Associates of Sputum-Positive Index Cases* | | | | | | | | |
| Total | 2,364.75 | 18 | 7.6 | 1,235.75 | 9 | 7.3 | 1,129.00 | 9 | 8.0 |
| Index Cases under 55 years | 1,644.75 | 15 | 9.1 | 905.50 | 8 | 8.8 | 739.25 | 7 | 9.5 |
| Index Cases 55 years and over | 720.00 | 3 | 4.2 | 330.25 | 1 | 3.0 | 389.75 | 2 | 5.1 |
| | *Associates of Other Than Sputum-Positive Index Cases* | | | | | | | | |
| Total | 7,122.00 | 17 | 2.4 | 3,885.50 | 8 | 2.1 | 3,236.50 | 9 | 2.8 |
| Index Cases under 55 years | 5,100.50 | 16 | 3.1 | 2,804.75 | 8 | 2.9 | 2,295.75 | 8 | 3.5 |
| Index Cases 55 years and over | 2,021.50 | 1 | 0.5 | 1,080.75 | .. | ... | 940.75 | 1 | 1.1 |

incidence rate was 9.1 per 1,000 during the period of observation, while in associates of this type of index case of 55 years and over, only 4.2 per 1,000 developed manifest tuberculosis. Corresponding rates for associates of cases other than sputum-positive were 3.1 and 0.5. The numbers of cases in certain of the classes are small but it is of interest that the difference is in the same direction for associates of both classes of index cases, namely toward more tuberculosis in the households of younger index cases. If the risk is actually greater when the index case is younger, however, significant differences in prevalence as well as incidence would be expected. Final judgment on this question, therefore, must await a larger experience.

*Incidence according to sex of index case*—The material has been divided also by type and sex of the index case and the respective attack rates are given in Table 6.

Associates of female index cases had noticeably higher incidence rates than associates of male index cases. Among associates of sputum-positive index cases the incidence rate for associates of male index cases was 3.0 per 1,000 and for associates of female index cases 11.1 per 1,000. Associates of index cases other than sputum-positive had lower incidence rates; for associates of male index cases the rate was 1.2 per 1,000 and for associates of female cases it was 2.8 per 1,000. In each class of index case the highest incidence rate was noted in female associates of

TABLE 6

*New Cases of Tuberculosis by Sex with Rates per 1,000 Among Household Associates According to Sex and Classification of Index Case*

| | Total | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Person-Years | New Cases | | Person-Years | New Cases | | Person-Years | New Cases | |
| | | Number | Rate | | Number | Rate | | Number | Rate |
| | *Associates of Sputum-Positive Index Cases* | | | | | | | | |
| Total | 2,364.75 | 18 | 7.6 | 1,235.75 | 9 | 7.3 | 1,129.00 | 9 | 8.0 |
| Male Index Case | 1,010.25 | 3 | 3.0 | 440.75 | 2 | 4.5 | 569.50 | 1 | 1.8 |
| Female Index Case | 1,354.50 | 15 | 11.1 | 795.00 | 7 | 8.8 | 559.50 | 8 | 14.3 |
| | *Associates of Other Than Sputum-Positive Index Cases* | | | | | | | | |
| Total | 7,122.00 | 17 | 2.4 | 3,885.50 | 8 | 2.1 | 3,236.50 | 9 | 2.8 |
| Male Index Case | 2,707.50 | 5 | 1.8 | 1,162.25 | 2 | 1.7 | 1,545.25 | 3 | 1.9 |
| Female Index Case | 4,414.50 | 12 | 2.7 | 2,723.25 | 6 | 2.2 | 1,691.25 | 6 | 3.5 |

female index cases, this rate being 14.3 per 1,000 for female associates of female sputum-positive index cases. The next highest rate 8.8 per 1,000 was observed in male associates of female sputum-positive index cases. Caution must again be observed since it is not clear why a significant difference in incidence would not be reflected in higher prevalence among associates of female index cases.

There is, however, a suggestion that the risk of developing tuberculosis may be higher where associates are exposed to index cases under 55 years of age than when the index cases are older. Also it is suggested that the risk is greater for associates of female index cases than for associates of male index cases. Unfortunately the problem has certain complications which available material cannot resolve. In the sputum-positive class the average age of female index cases was 39 years, that of male 51 years; and in the other than sputum-positive, the respective averages were 44 years and 48 years. Thus, if there is a significant factor it may be either the age or the sex of the index case, or possibly both.

A second complication in interpretation is that neither the age nor the sex of the index case was closely related to variations in prevalence of manifest tuberculosis among household associates.

It is of interest that, regardless of the type, age, or sex of the index case, prevalence and incidence rates were higher for female than for male associates. This may be interpreted as reflecting a closer relationship between females in the household and the patient, or on the other hand it may reflect greater susceptibility of female associates. The finding of higher prevalence among females than males when the index cases were over 55 years of age but a smaller excess when index cases were younger is in need of confirmation. If true, the explanation may indeed be more continuous association of females with tuberculous patients, that is, greater exposure of female associates.


## SUMMARY

1. Prevalence and incidence of tuberculosis morbidity in household associates, by sex, have been determined for different classes of index cases according to age and sex of the index cases.

2. Among index cases, females were more numerous than males. This was also true for those cases found as the result of examination of household contacts.

3. Among household associates a higher proportion of females was found to have manifest tuberculosis, and a smaller proportion of females escaped tuberculous infection.

4. Prevalence and incidence rates were somewhat higher among associates of index cases under 55 years of age than among associates of index cases 55 years of age or over.

5. The risk of development of manifest tuberculosis appeared to be greater among associates of female index cases and this risk seemed to be greater in female than in male associates. Available data are, however, too limited to allow a final judgment on the importance of sex of the index case. Such judgment must await accumulation of a larger body of data.


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# Simplification of Laboratory Control Procedures for Market Milk*

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THE effort to simplify the procedures used to determine the quality of market milk has gone on continuously for many years. It has, nevertheless, received an added stimulus because of the present war emergency. Laboratory men have made real progress in the development of simplified tests during the past few years, and can apparently point with pride to results accomplished. Milk sanitarians who have tried to hold milk inspection procedures to essentials without unnecessary duplications in farm and milk plant inspections can also feel that progress has been made although the dairy farmer and the industry are still plagued with a multiplicity of inspections and inspectors. Too frequently regulations are of a type that specifies that construction of barns, milk houses, etc., and cleaning, sterilizing, or other procedures must be carried out in a specific way, whereas the primary function of the inspector should be to see that the consumer receives clean, fresh, safe milk. Both the farmer and the milk plant men frequently know methods of producing milk that meets the standards fixed that are more practical than are the methods specified in regulations; or at least can learn them from agricultural extension agencies, maintained to bring them the latest and best information in the agricultural field.

Reliance should be placed on tests applied to milk itself, and these tests should be of a type that can be applied before the milk is used. If they can be used by the field, rather than by the laboratory workers, so much the better. Where quality is found to be wanting, the results secured should direct the corrective procedures.

It is not possible to discuss all possible approaches to this problem in the brief time at our disposal, and this paper will be limited to a discussion of methods that seem to be giving good results.

The American Public Health Association Report on Standard Methods for the Examination of Dairy Products offers a wide choice in analytical procedures for determining the quality of milk, both as delivered at receiving stations and as delivered to the consumer. From this report, it is possible to make selections that are suitable for use under widely different local conditions.

## METHODS USEFUL IN CONTROLLING THE QUALITY OF RAW MILK AS DELIVERED FOR PASTEURIZATION

Procedures that permit poor quality milk to be recognized and rejected before it is mixed with other milk are the best ones to use at this point. No test has been developed that permits as rapid recognition of poor quality milk as the odor test applied by smelling the inside of the cover as the can is opened

* *Journal Paper No. 546*, Jan. 26, 1943, New York State Experiment Station, Geneva, N. Y. Presented before the Laboratory Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 29, 1942.

to dump the milk into the weigh vat. This in itself requires no laboratory equipment and the odor can be determined by the trained person as rapidly as the cans can be opened and dumped. Only those who have had experience with it, will realize how effective this time tested and simple procedure can be made. The method has been used by the industry itself ever since milk dealers began to buy milk from producers, but it had never been tried on a large scale by dairy inspectors until a system of deck inspection based on the odor test was put in widespread use in the New York City milk shed in 1937. The odor test is supplemented in this work by an examination with a strainer dipper to detect sediment and flaky milk.

In this discussion of the results secured in this deck inspection control, I shall draw freely on a recent report of this work by R. L. Furnia of the New York City Milk Inspection group.* In 1937, the New York City group of Inspectors put into use the training they had secured in several conferences held at the Experiment Station at Geneva, at the College of Agriculture at Ithaca, in New York City milk plants, and elsewhere. At these conferences, the men who were to do the work had had opportunity to examine cans of milk with known defects in quality until they became confident that they could recognize milk that showed marked defects in quality.

During 1937 these inspectors examined 1,082,497 cans of milk on the receiving platform, rejecting 20,397 cans (1.9 per cent) as unfit for use. Operators of milk plants rejected many more, the figures given including the cans examined by the city inspectors only. The three main causes for rejection were: improper cooling 52 per cent, dirty utensils 16 per cent, and mastitis milk 10 per cent. This work was found to be so valuable that it has been continued.

In 1941, the city inspectors examined 1,341,679 cans of milk on receiving platforms, and rejected 19,260 cans (1.43 per cent). The causes for these rejections were listed as improper cooling 28 per cent, dirty utensils 33 per cent, mastitis milk 14.5 per cent. Because the factors that produce poor quality milk are many and varied, it is not worth while to speculate on the reasons for differences in the results secured.

When a can of milk is rejected, the procedure followed by the New York City Inspection group is to attach a red tag to the can and to check the cause of the rejection on the tag. This can be done readily when the milk is rejected because it is dirty (visible dirt on the strainer dipper), flaky, too warm, or because of odors. However, if the "odor" has caused the rejection, it is necessary to check results by making a direct microscopic examination to determine whether the odor is due to feed or weed odors (ensilage, molasses, wild onions, cabbage, turnips, etc.), to souring of the milk, or to mastitis. All of these things cause readily recognizable odors and the inspector who checks his findings with a microscope soon becomes remarkably accurate in detecting the cause of the odors. In a recent series of 100 cans rejected for bacterial odors, 16 contained the mastitis streptococcus and leucocytes in excessive numbers. The odor of such milk is recognizable and this type of milk represents the most objectionable type of milk received. While it is usually true that the streptococcus found is of the bovine type, in rare cases this may be of the human hemolytic type and capable of causing a virulent septic sore throat or scarlet fever epidemic.

Occasionally the bacteria found may be of the food poisoning staphylococcus type. This was well illustrated by what

* Furnia, R. L. Causes and Reasons for Rejected Milk. *16th Ann. Rep., New York State Assoc. Milk Sanitarians*, Sept. 24, 1942.

happened in May, 1942, in the home of a dairyman near Geneva. A can of milk rejected by a New York City Inspector for a bacterial odor was left to stand for 24 hours without refrigeration. Then the cream was removed and used for making homemade ice cream. All of the four children and one adult who partook of the ice cream suffered from typical staphylococcus food poisoning, and examination of the cream showed these organisms to be present.

On another occasion, a prominent dairyman from the same area brought me a sample from a can of rejected milk. He was angry because, as he told me, the inspector had picked only one can as bad out of the 16 sent to the receiving station. All of the cans had been handled in the same way and he was confident that if 15 cans were good, all were good. However, when the milk was examined under the microscope, it was full of mastitis streptococci and the reason for its rejection was obvious. As there was but one cow with a bad quarter, the reason for the rejection of one can only was also evident. Probably a more careful examination on the platform would have revealed a second can that should have been rejected.

While it is not claimed that the rough tests used on the platform with great rapidity yield results that are 100 per cent accurate, a good inspector does not reject milk that ought not to be rejected. He may miss some poor quality milk, but the farmer who tries to get by with careless methods is sure to be caught and caught promptly when the platform inspection is carried out frequently. Skill in this work can be developed readily by any person with a normal sense of smell.

At smaller pasteurizing plants it may be possible to take samples for microscopic examination from each can of milk. This is the procedure followed at the two small plants in Geneva, N. Y. If cans of poor quality milk are found, an inspection with microscopic examination of the milk is made on the receiving platform the following morning of the milk from the farm that sent the bad milk the previous day. Bad cans of milk are then returned to the dairyman.

I am told that an adaptation of the platform type of inspection based on a preliminary test with methylene blue, with subsequent microscopic examination of rejected milk, is being tried in California at the present time. Such adaptations are practical and bring results that are effective in correcting bad conditions.

### PROCEDURES USED IN JUDGING QUALITY OF BOTTLED PASTEURIZED MILK

I shall not need to take up a discussion of the simplified procedures now in use in many places for judging the quality of bottled, pasteurized milk as W. D. Tiedeman, of the New York State Department of Health, one of the pioneers in the use of the phosphatase test, coliform technic, and microscopic examination system for the control of bottled pasteurized milk, is to discuss his experience with these three tests later in this session. Likewise, Dr. Friend Lee Mickle, our presiding officer today, is to discuss his experience in Connecticut with the same "Three Test System" as he has christened it in a paper to be given before the International Association of Milk Sanitarians.

As shown by Burgwald (*J. Dairy Sci.*, 25:1942, 285–291) public health workers generally have found the short New York City phosphatase technic the most satisfactory phosphatase test for use, as it gives results quickly enough to make it possible to place an embargo on milk before use. However, the best evidence indicates that results from any of the four phosphatase technics described in the Appendix to the 8th edition of *Standard Methods for the Examination of Dairy Products* can be depended upon to yield sufficiently accurate results to

be usable. Results secured with these technics duplicate each other excellently where used for checking the pasteurization of milk heated to 143° F. for 30 minutes. Adjustments must be made in standards where higher or lower pasteurization temperatures are in use.

There is good reason for preferring the sodium formate ricinoleate broth test where examinations are to be made of pasteurized milk for bacteria of the coliform-dysentery-typhoid group. Positive results secured from this test should not be regarded as necessarily indicating the presence of coliform bacteria only, because bacteria belonging in the genera *Serratia, Proteus,* and *Salmonella* may also ferment formates with the production of visible gas. However, properly pasteurized milk ought not to contain viable organisms belonging to any of these genera in 1 ml. quantities as the milk leaves the pasteurizer.

It is not necessary to use 5 tubes for each of three dilutions, except where it is desired to determine the number of organisms present that will ferment formates with the production of visible gas with a fair degree of exactness. A test of 15 samples made from 1 ml. quantities in 15 different tubes will give more information about a given milk supply than a test made with 15 tubes prepared from one sample. In our experience, when pasteurized milk is contaminated during the bottling process, the contamination is normally bad enough to give positives in all 1 ml. quantities tested. The chief thing to remember in making coliform tests is that, in order to make results significant, samples must be taken at the pasteurizing plant and they must be tested *at once.* Coliform organisms grow so readily in milk that results secured from testing samples of milk that have stood longer than 2 or 3 hours after taking are always open to question. Likewise bottled milk should be tested within 2 or 3 hours after it is bottled.

Some further experience is needed, before the standard that should be used where direct microscopic counts are made of the number of clumps of bacteria found in pasteurized milk can be fixed. It is clear that practically all of the bacteria killed during pasteurization lose their staining power or disappear completely during pasteurization. The bacteria found in stainable condition in pasteurized milk consist normally of (1) those bacteria that are heat resistant enough to persist through the pasteurization, (2) thermophilic bacteria that may have grown during preheating, filtering, in the foam, or elsewhere, and (3) bacteria added from the utensils with which the milk comes in contact during the bottling process. If the milk stands 24 hours before delivery, growth may also cause an increase in the number of living bacteria present. These problems are discussed by Walter D. Tiedeman.

## CONCLUSIONS

In closing, I should like to emphasize again the desirability of basing the entire milk control program on tests of a type that can be applied by the inspector on the spot with subsequent rejection or embargo placed on the milk before use. This sort of a program is possible with the laboratory tests now available *provided* trained and competent inspectors are available. In many cases it may be necessary to carry out laboratory tests for the sake of records or to support actions that may be questioned in court, but it is clear that the best control work is now being done by persons trained and equipped to make tests of milk quality on the spot where the sample is taken.

# Laboratory Control of Milk under War Conditions*

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WITHIN the time allotted I should like to touch briefly on several phases of the influence of the war on milk control.

## 1. MILK LABORATORY SURVEYS IN WAR AREAS

During the past year Dr. L. A. Black, a bacteriologist of the U. S. Public Health Service, has been making surveys of milk laboratories in defense areas throughout the country to determine whether equipment and procedures employed in bacteriological examinations are in conformity with the *Standard Methods for the Examination of Dairy Products,* and to suggest improvements toward that goal. Uniformity of laboratory technics is considered particularly desirable at this time because the new and sudden concentrations of troops and civilians have brought about a considerable increase in the importation of milk from other milk sheds. It is not the purpose of these surveys to find fault but to be constructively helpful. Laboratories are visited only upon invitation of the state health departments, and survey reports with recommendations are forwarded to the states, with a duplicate copy for the laboratory in question.

To date nearly 300 laboratories have been surveyed in 39 states, and the first round of surveys will probably be completed within the next few months. In the early surveys the form used was based on the seventh edition of Standard Methods, but for the later ones the survey form was revised in accordance with the eighth edition. The form covers details of the bacterial plate counts, the direct microscopic count, the reductase tests, and miscellaneous information, and provides spaces for indicating departures from Standard Methods. It should be of value to any laboratory for checking its own technics.

During the survey of each laboratory, observations were made of the equipment, the general preparation and sterilization of material, and of the technics used in the analyses. Correct procedures were demonstrated and suggested, and blank copies of the forms left as a guide. Numerous consultations have been held with municipal, state, Army and Navy officials in the interest of increasing the dependability and accuracy of the results of the bacteriological examination of milk. Many Army Service Command laboratories have been visited, and the directors of these laboratories acquainted with the form being used. The Army has requested permission to reproduce the forms for the use of its laboratories. In many of the states it has been possible to familiarize someone in an official

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 29, 1942.

capacity with the details of the required procedures, so that they might consult with the local laboratories in case of need.

It is not my intention to present here the results of the surveys, as these will be available to those who are interested through a paper to be presented by Dr. Black before this Annual Meeting. At this time I wish to highlight two or three conclusions, as follows:

1. Many of the Standard Methods requirements are not being followed. For example, the average milk laboratory in the first 26 states surveyed complied fully with not more than half of the 25 main items into which the plate count Standard Methods were divided.

2. The survey indicates the need for an adequate system of state approval or licensing of bacteriological milk laboratories. The type of approval now practised in a few states is nominal or based on equipment only, and therefore gives a false sense of security.

3. Consideration should be given to those requirements of Standard Methods which are frequently violated, with a view to revising or deleting those that do not contribute substantially to the reliability of the results.

Plans are being made for continuing the surveys after the completion of the first round, in order to determine the extent of improvement in equipment and procedures. On the second round it is hoped to visit additional laboratories not previously surveyed, and to spend more time at each than was possible on the first round.

### 2. REVISED ARMY MILK SPECIFICATIONS

Heretofore the Army specifications for Type III pasteurized milk have included rather meager standards for producing farms and no bacterial standard for the milk prior to pasteurization. Type III pasteurized milk is purchased when neither Type II No. 1 nor Type II No. 2 is available. The production standards for this type of milk have been raised in the revised tentative U. S. Army specifications set forth in the Quartermaster General's *Circular Letter 377*, dated October 5, 1942. The new paragraph reads as follows:

> Raw milk for the production of Type III pasteurized milk shall, upon delivery to the pasteurization plant, have an average bacterial plate count of not to exceed 1,000,000 per cc., or a comparable direct microscopic count, or an average reduction time of not less than 3½ hours. It shall be produced on premises on which buildings, installations, equipment, water supply, facilities, methods and procedures incident to the production, handling, storage and transportation of raw milk are such as to assure that there is delivered to the pasteurizing plant a wholesome milk.

While these revised standards leave much to the judgment of Army veterinary inspectors, they reflect the recognition by Army authorities of the need for farm sanitation and farm inspection even for the lowest grade of pasteurized milk acceptable for Army use.

### 3. NEED FOR BETTER CONTROL OF THE PASTEURIZATION PROCESS

The critical shortage of fluid milk available for Army and civilian use in many sections of the South and West is being overcome to an increasing extent by the diversion of lower grade milk from manufacturing channels. Under such circumstances it will be necessary to maintain safety and wholesomeness largely by more careful control of the pasteurization process.

The laboratory tests ordinarily employed for pasteurized milk fall short of filling this need. They are valuable in furnishing a record of what has happened between inspections, but most of them are of little practical service because the results are not available soon enough to permit the condemnation of contaminated or improperly pasteurized milk. This is true of the plate count, the coliform count, and of the various

phosphatase tests, except the Scharer field test.

We all recognize the fundamental principle of public health that an ounce of prevention is worth a pound of cure. Let us prevent those hazards to which the pasteurization process is still heir by developing and utilizing speedy tests, the results of which are available in time to keep unsafe milk off the market. In the meanwhile the best preventive measure lies in more frequent and more careful inspection of plant equipment and procedures.

# Laboratory Control of Milk under War Conditions*†

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THE present emergency is forcing us to reëxamine many of our activities and to ask ourselves whether we can get the information we want with less trouble and expense than with our customary procedure.

It is generally agreed that milk for pasteurization should be reasonably free from sediment and have a reasonably low bacterial content. In addition, freedom from excessive numbers of thermoduric bacteria is being stressed in certain areas. Milk as the secretion of a healthy udder is, however, receiving far less attention than it deserves.

The ideal test is unquestionably one which will enable the instantaneous recognition of unacceptable milk. Such a test has yet to be devised. Even the odor test was shown by Schacht and Nichols[16] to detect only a small fraction of the poor quality milk. Platform tests must therefore be supplemented by some other test. Particularly under the present circumstances, with growing shortages of technicians, supplies and equipment, there is much to be said for the use of one of the dye reduction tests. Such tests will vary in the amount of information furnished, but any one of them can form the basis for a quality control program.

Of these tests, the methylene blue reduction test is the most widely used. It has considerable appeal because of its simplicity. When the creaming error is minimized by periodical inversion of the tubes to re-distribute the bacteria in the cream layer[4, 6, 17] it correlates reasonably well with the bacterial content as revealed by the direct microscopic count of *individual* cells. As the quality of a given milk supply improves, however, long hours of incubation are involved. This is one of the principal objections to the test.

Because it offers a considerable saving of time over the methylene blue test, the resazurin test has come into the picture in many countries. However, the original "one hour" test as described by Ramsdell and coworkers has certain shortcomings. Milks containing large numbers of dormant bacteria frequently fail to show a significant color change within one hour; the same is true of some herd milks containing large numbers of leucocytes.[7] If, however, milk is incubated until a pink end point is reached, there is a much better correlation with the methylene blue results with a saving in incubation time of from 25 to 33 per cent.[2, 7]

While overcoming one shortcoming of the "one hour" test, the "pink" test loses an advantage of the former. Abnormal milk (mastitis, late lactation, colostrum, etc.) shows a distinct color change during the first 2 or 3 hours—though not always in the first hour.[9]

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* Presented before the Laboratory Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 29, 1942.

† Contribution No. 166 (*Journal Series*) from the Division of Bacteriology and Dairy Research, Science Service, Department of Agriculture, Ottawa, Canada.

Having reached a certain stage, little further change in color takes place until bacterial activity brings about reduction to the pink, and finally to the white stage. Consequently, the pink end point test is of little value in the detection of abnormal herd milks.

In view of the increasing attention being given to abnormal milk in milk control work, a modification of the resazurin test was sought which would combine the sensitivity of the "one hour" test for abnormal milks with the greater accuracy of the "pink end point" test for bacteria. This was finally found in the "triple reading" test described by Johns and Howson,[9] in which a color approximately half way between the original blue and the full pink (Munsell P 7/4) is taken as the end point. By observing and recording those samples which have passed this end point at 1, 2, and 3 hours, each sample can readily be placed into one of four grades.

The hourly recording of the degree of color change in the resazurin-milk mixture is particularly useful when applied to a reasonably low count milk supply. The lag following the initial marked change indicates those herds where mastitis or stripper cows may be suspected. One Ottawa dairy has made considerable headway in eliminating such abnormal milk through this method.

The triple reading test thus furnishes more complete information concerning the sanitary quality of each producer's milk with less expenditure of time and less need for trained technicians and apparatus than any test we have studied. The saving in time compared with the other dye reduction tests in the evaluation of first grade milks of equivalent quality is evident from the following:

| | | |
|---|---|---|
| Resazurin triple reading test | 3 | hours |
| " pink test | 4½ | " |
| Methylene blue (modified) | 6 | " |
| " " (standard) | 8 | " |

The resazurin one hour test is useful at the start of a quality control campaign, but since it fails to differentiate between microscopic counts below 2,000,000 per ml.,[9] a more sensitive test should subsequently be introduced.

Little[10] has adopted a purple pink end point, presumably very close to our Munsell P 7/4. He finds this is reached in approximately half the time required to reduce methylene blue. Fullest information is obtained by observing tubes every ½ hour for 2½ hours, although where this cannot be done milks may be graded by a single reading after 2½ hours. In his latest report[11] tubes are read every 30 minutes for 3 hours, when smears are prepared and examined under the microscope to determine the type of bacteria predominating. It may be open to question whether the 30 minute readings he employs yield enough additional information over the hourly readings to warrant their use in a routine test. Burgwald[1] has also found the P 7/4 end point superior to the pink.

One drawback to the wider use of the resazurin test is that many small plants lack facilities for preparing the dye solution. In Britain standardized tablets are now on the market, and no doubt similar tablets will soon be available on this continent.

It should be emphasized that none of the tests ordinarily employed for measuring the bacteriological quality of raw milk can be relied upon to detect large numbers of thermoduric bacteria.[11] However, these are less frequently present where the general level of counts is kept low.[11, 12] Our own studies[3] show that of samples showing plate counts of under 5,000 per ml. after laboratory pasteurization, only 12.3 per cent had microscopic clump counts of over 500,000 before pasteurization, while of those over 5,000, 62.7 per cent had counts over 500,000 before pasteurization.

During the past year we have compared various methods suggested for the detection of significant numbers of thermoduric organisms. The resazurin test applied to pasteurized milk was found to be of no value, since thermoduric organisms generally show very weak reducing activity.[9] In our studies the microscopic count methods described by Hileman and Leber,[5] and Mallmann, Bryan and Fox[13] failed to show as good a correlation with the plate count of laboratory pasteurized milk as was reported by the respective authors. The oval tube technic of Myers and Pence[14] gave much better agreement and showed considerable savings in time, media, glassware, and incubator space as compared with the plate method. Little[11] also reports very favorably on the oval tube method, and believes it is capable of replacing the plate count altogether in routine control work.

To summarize briefly, a quality control program may be carried out with simplified laboratory procedures which make less demand upon skilled help, apparatus, and supplies. The "triple reading" resazurin test has definite advantages for the grading of milks on the basis of both bacterial and leucocyte contents, while the oval tube method is preferred following laboratory pasteurization for the detection of milks containing thermoduric organisms in significant numbers.

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# Laboratory Control of Milk under War Conditions*

## The Rapid Phosphatase Test

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THE rapid expansion of the use of the phosphatase test in the testing of pasteurized milk supplies almost necessitates a yearly review in order to present the advances in technic and application. Although the test was first presented as an involved laboratory procedure, its simplification has permitted its use by many who would not otherwise be able to avail themselves of its undoubted merit, and accounts for its adoption from Alaska to South Africa, and from Iceland to Australia.

The use of the so-called field test or "screen test" will continue to be justified, particularly in view of the growing shortage of technicians, but its wide adoption, and the increasing reliance placed upon its interpretation, call for a warning note. Almost inevitably, whenever a laboratory procedure is placed at the disposal of persons untrained in the laboratory, there are abuses of technic leading to unreliable results. These abuses usually involve simple precautions which a laboratorian, through his background of training, would always employ. Such conditions involve the careful preparation of reagents and the use of adequate controls. Instructions presented in the "Standard Methods" which were intended to provide safeguards on these points have not infrequently been glossed over. It is of vital importance that these precautionary safeguards be iterated and reiterated if reliable results are to be obtained, and, conversely, when these simple measures are taken, reliable results are always obtained.

For example, taking into consideration the relative instability of the buffered substrate and the dibromoquinonechloroimide solution, it was urged that fresh solutions should always be employed, and that only sufficient solution be prepared for immediate needs. Bisected tablets were provided which permitted the rapid, inexpensive preparation of solution sufficient for just a few tests, yet there are numerous instances where old solutions are employed, leading to wholly unreliable results which may be either falsely negative or falsely positive, depending on the state of decomposition. If the procedure were adopted of always using known controls of both a pasteurized milk and one to which a small amount of raw milk is added, these false results could immediately be discounted. In the absence of a pasteurized control, it is a relatively simple matter to heat a portion of the sample to above 160° F. for a minute, and then, after permitting it to cool, to use it as a pasteurized control. The so-called positive control, simulating the presence of a small amount of raw milk, can be obtained

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 29, 1942.

by adding to this heated sample a small amount of a 0.005 per cent solution of sodium sulfocarbolate (sodium phenolsulfonate).

Unfortunately the manufacture of 2, 6 dibromoquinonechloroimide, is a difficult problem, and it is to be greatly deplored that some of our largest manufacturers have released batches of this compound which are wholly unsuited for use with the phosphatase test. Many users have complained that succeeding batches of this compound, because of its non-uniformity, have given quite different results and even required a new evaluation of standards. One lot of the compound gave a positive on every sample tested. Properly prepared, this compound is available at low cost in the form of golden yellow crystals and is extremely stable and completely reliable.

The use of the double control on the test will also detect those sources of error which are due to the presence of phenolic material in the water used to prepare the disodium phenyl phosphate solution. Where such contamination is indicated, the phenolic product can be removed from the water by extraction with ethyl ether.

The extraction of the indophenol blue, developed in the test by means of neutralized normal butyl alcohol, is a stumbling block for many, since in the desire to prevent the formation of an emulsion, the extraction is frequently incomplete. But if the test tube in which the extraction is performed be inverted quickly, 3 or 4 times, and then laid flat to permit the separation of the butyl alcohol before this act is repeated, the emulsion seldom occurs. Centrifuging, if possible, for 2 or 3 minutes, readily breaks the emulsion and permits evaluation by comparison with the suggested color standards.

The growing strategic importance of normal butyl alcohol to the war effort, and its unavailability to many, have prompted a further modification of the rapid phosphatase test which is midway between the earlier "field test" and the laboratory procedure, and which can be utilized equally well by the laboratory or the inspector. For that reason, the name "control test" is suggested. A study of the kinetics of the enzyme activity and the interrelated pH conditions of hydrolysis and of the indophenol formation indicated that if the incubation period be extended to 1 hour, and dispensing with the precipitation technic, and adding the dibromoquinonechloroimide directly, the test becomes sufficiently sensitive for all practical purposes, i.e., sufficient color difference is developed between a properly pasteurized milk and an improperly pasteurized sample, to be readily apparent, so that the butyl alcohol technic need only be employed in borderline instances, or where greater certainty is required. This modification is suggested where time is no great factor.

In the application of any of the technics to high temperature-short time pasteurization, it is necessary to have some information regarding the preheating time and temperature, as well as the rated holding time and temperature before the results of the test can be properly evaluated. Similarly in the case of cream, it is frequently necessary to have some knowledge of the history, particularly the age of the sample after pasteurization, before a sample may definitely be classed as improperly pasteurized. There are certain bacteria which multiply very rapidly in cream under refrigeration, and which, within 36 to 48 hours after pasteurization, will produce a bacterial phosphatase in quantities sufficient to give a positive test. Moreover, these bacteria are seldom evidenced in the standard plate count, since their optimum growth occurs at temperatures far less than those normally employed. Characteristic of the presence of those organ-

isms, is a peculiarly offensive odor and a thickening of the cream sample. This condition is not met in freshly pasteurized creams. Aside from the exceptions just indicated, and provided acceptable reagents are employed, there is no reason to doubt a positive finding with the phosphatase test. If inspection fails to indicate the cause, the test results are no less correct and indicate a closer coöperation between inspection and testing.

# Laboratory Control of Milk under War Conditions*

## Milk Testing, under Emergency Conditions

R. V. STONE, SR., D.V.M., F.A.P.H.A.

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THE Pearl Harbor treachery stimulated early action in Los Angeles County to formulate a Dairy Industry Emergency Civilian Defense General Committee. On January 8, 1942, a General Chairman, Acting Secretary, and twelve committees were set up. These included:

Field Production Committee
Country Transportation Committee
Public Utilities Committee
Emergency Processing Committee
Blackout, Air Raid, Fire, First Aid, Watchmen and Personnel, Transportation
Creamery Supply Men Committee
Bottle Caps and Paper Committee
Glass Milk Bottles Committee
Producers Committee
Rolling Stock Committee
Labor Committee
Technical Committee

### TECHNICAL COMMITTEE

The Technical Committee was assigned, primarily, to laboratory and associated problems that might be expected as involved in any major bombing or attack disaster. The members of the Technical Committee appointed represent the—

Los Angeles County Laboratory
Los Angeles City Laboratory
Pasadena City Laboratory
State Department of Agriculture
Dairy Inspection
Dairy Industry

The Dairy Industry Emergency Committee is affiliated with the Los Angeles County Resources and Production Committee, headed by the County Agricultural Commissioner.

The Technical Committee held its first meeting on January 16, 1942.

A free discussion of problems that might be expected as a result of an attempted invasion, etc., was augmented by suggestions received by the chairman of the committee.

Actual problems resulting from invasion or bombing, etc., are anticipated in degrees of minor to major emergencies. Planning effectiveness will only be apparent if and when they must be placed in actual operation.

We have considered possibilities as: (1) Localized damage, minor; major; and (2) County-wide damage, minor; major.

Minor damage would not include serious failures in power or water supplies, but would involve localized or general interference with a normal routine. Major damage would involve the actual paralyzing of the usual accommodations available for standard laboratory procedures.

Within the 4,085 square miles area of Los Angeles County territory, twelve laboratory stations have materials and instruction for proceeding in the case

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 29, 1942.

of an emergency. There are sufficient supplies in each center to absorb work from an adjacent damaged area. Previous experiences in a mild earthquake produced inconvenience and provided some guidance in this planning. Personnel are instructed to report as soon as possible to their assigned positions in case of emergency, but if their own station is damaged to such a degree that it is unable to function, then these persons are to report to the next nearest station. Plans are set up for:

1. Conducting the work as nearly by routine procedure as possible.
2. Facilities for *emergency* procedures are available in each Center.

These include:

1. A stored, stable medium ready to melt and pour into plates.
2. Phosphatase kits (Scharer) sub-strate and indicator tablets.
3. Facilities for microscopy; *E. Coli* index, reductase test, sediment testing, etc., as needed.
4. Facilities for utilizing a substitute for a standard plate count; designed by Ray Hasson of the Griffin-Hasson Laboratories, Los Angeles, Calif.[1] This is a small French square bottle with a Bakelit screw cap; two ounce.

Agar is poured on one inner side of this bottle. The Bakelite cap is screwed on tightly; the bottle neck and cap is then dipped into molten paraffine. This keeps well as a stored, ready to use unit. This can be used even though pipettes, incubators, dilution bottles, etc., are out of commission. Planting is accomplished by pouring the liquid sample onto the surface, and immediately pouring this off, and draining the bottle for a moment before recapping. Stand on end; cap down during incubation. Colonies developed by this technic compare as favorably to each other, in duplicate, as do standard plate counts. Milk samples can be detected as "too numerous to count," grading down to only one or two or no colonies. Rapid separation of samples into good, fair, poor, and bad is simple, even for an emergency worker, and by visual inspection. Occasional spreaders can give trouble.

A differentiating medium such as E.M.B., can be used in this bottle technic. This is a practical, usable, emergency procedure which requires no laboratory; can be "incubated" at room temperature in a dairy, in a home, almost anywhere, and serves a real emergency need; it should not be "brushed" aside as too far removed from Standard Methods.

Personnel licensed for laboratory practice by the State Department of Public Health is much in demand. In a serious emergency we can anticipate that blood bank and similar activity will necessitate using personnel for some of the work, other than bacteriological major, graduate students. This has been kept in mind in our planning. Procedures that can be carried out by high school or undergraduate student volunteers cannot involve too much skilled technic. The phosphatase, reductase, sediment, and Hasson bottle tests can be satisfactorily assigned to such workers under the supervision of a licensed laboratorian.

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# Laboratory Control of Milk under War Conditions*

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WAR has brought with it both the usual scarcity of materials and man power affecting all branches of health work, and the possibility of the disruption of normal supplies and procedures by damage from bombing or sabotage.

New York State has made reasonable preparations and taken such precautions as appear to be necessary to minimize the effects of bombing and to frustrate attempts at sabotage.

A matter of immediate concern in milk laboratory work, however, is the shortage of man power and possible shortages of materials such as agar agar that enter into the standard tests usually applied to milk.

This has indicated the necessity for a critical reëvaluation of the relative public health values of the various tests being used in the examination of milk. Much has been said in the past [1, 2, 3] about inaccuracies and inconsistencies in standard plate counts. In recent years some good work has been done to improve the standard plate count technic. However, frequent gross inconsistencies between the standard plate count and direct microscopic count on the same sample of milk indicate that in many instances the standard plate count still comes far from determining the actual bacterial content of the milk.

Furthermore, standard plate counts of samples from a raw milk supply proved to be responsible for an outbreak of septic sore throat showed counts of 10,000 or less with the infected milk in the supply. This is another indication that the standard plate count fails to answer the question that should be uppermost in the health officer's mind, namely, "Is this milk safe for human consumption?"

At the annual meeting of this Association in 1937 Tiedeman and Hohl [4] advocated the use of the phosphatase test, coliform test, and direct microscopic count instead of the standard plate count in the examination of samples of pasteurized milk. A practical example was cited of a case in which the effort of a health officer to control a pasteurized milk supply using the standard plate count resulted in his unwittingly converting a safe supply of pasteurized milk into a decidedly unsafe one.

There appears to be general agreement among health officials that the public should have milk of good bacteriological or sanitary quality, that has been pasteurized and has not been recontaminated after pasteurization. Thus the use of the phosphatase test to determine adequate heat treatment or pasteurization, the coliform test to show possible contamination after pasteurization, and the direct microscopic count to indicate bacteria content in a general way should give the health officer just what he needs to know. Of course,

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 29, 1942.

the standard plate count may be used in this program, and the proposed use of the direct microscopic count on pasteurized milk requires further explanation.

The phosphatase test for pasteurization has rapidly come into general use. The continuous use of the test in New York State for the past seven years has convinced workers there of its value and reliability. It reveals the thing health officers should want to know most, namely, whether the milk or cream sampled has been adequately heat treated and has not been diluted excessively with raw milk. It appears that the reagents for making this test will continue to be available in wartime. While many man-hours are required to run the test, the work is justified in our opinion until a simpler method of equal reliability is developed, because of the value of the information secured.

The coliform test should be used along with the phosphatase test to detect the possible recontamination of milk or cream after pasteurization, either indirectly or by a very slight dilution with raw milk or cream that cannot be detected by the phosphatase test. This test too requires considerable man power and materials. However, the materials have not as yet become critical and the value of the test in our opinion justifies the expenditure of time.

There is one economy in the use of the coliform test that may be made without much sacrifice. Most laboratories are running three or more tubes. A study of reports on 1,813 coliform tests made in a New York State laboratory shows that the percentage of positive results obtained was increased only from 27.2 to 33.6 per cent by the use of three 1 ml. portions instead of a single 1 ml. portion

The substitution of the direct microscopic count for the standard plate count in the examination of pasteurized milk and cream offers the greatest possibility in this field for wartime conservation. Considerable saving is to be made in time and materials. However, although the use of the standard plate count may not be essential, the habit of making and using standard plate counts may be difficult to break.

The question immediately arises whether or not dead bacteria stain and are counted in the direct microscopic method. In using the direct microscopic count on pasteurized milk and cream for plant control during the past five years we have not attempted to settle this issue but have applied the prepasteurized bacterial standard to pasteurized milk and cream. The finding of a direct microscopic count above the limit has been interpreted as meaning that the prepasteurized milk did not meet the bacterial limit.

There is evidence [5, 6] to indicate that dead bacteria, or at least some kinds of dead bacteria, do not stain. However, comparisons of standard plate counts with direct microscopic *clump* counts on identical samples of pasteurized milk show decidedly higher counts by the direct microscopic method. It does not seem to be essential to correlate the two counts, but in our opinion it should be sufficient to set new standards for the direct microscopic clump count on pasteurized milk and cream.

A study of 297 such counts made by Gilcreas will illustrate these variations. Of 240 samples with standard plate counts of 30,000 or less, the following grouping of direct microscopic clump counts were obtained: approximately 43 per cent were 30,000 or less, 22 per cent were more than 30,000 and not over 100,000, 13 per cent were more than 100,000 and not over 200,000, and the remaining 22 per cent were over 200,000.

Investigating the practical aspects of this problem as it applies to 361 comparative counts on samples of pas-

teurized milk, 66.5 per cent of the samples complied with a standard plate count limit of 30,000, and 61.7 per cent of the samples complied with an arbitrary direct microscopic count limit of 200,000. From this it appears that only a slightly lower compliance might be expected with a limit of 200,000 for the direct microscopic clump count on pasteurized milk than with a limit of 30,000 standard plate count.

In our opinion the adoption of a 200,000 direct microscopic clump count limit on pasteurized milk used in conjunction with the phosphatase test and the coliform test should enable health officials to maintain adequate public health control of such milk supplies without the use of the standard plate count.

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# Units of Local Health Service for All the States

## Progress Report *

BOTH of the professional organizations concerned with the application of the science and art of medicine for the individual and his family, and through the agency of civil government for the protection and promotion of the health of communities and population groups, have within the past year declared in official pronouncements, expressed through the democratic procedure of their representative bodies,† their interest in the complete coverage of the area and population of continental United States by local units of health jurisdiction.

Information of a precise and authoritative kind was not available as to the extent to which the services of public health were in fact applied through full-time professionally trained or experienced medical health officers for our people under the jurisdiction of some unit of local government. Nor was there a sound basis of fact from which an estimate could be made of the number of professional and assistant personnel needed to make effective at a modest or minimal level units of local health service reaching all areas of civil government.

To review the existing full-time local health services in each state and to prepare information in a practical form for use in promoting the extension of such services to their logical completion for all the people, the American Public Health Association, through its standing Committee on Administrative Practice, created in July, 1942, a subcommittee on Local Health Units.

It is assumed that by units of full-time local health service are meant departments of health of single or several counties or districts which are administered by a health officer devoting his entire time to such public employment, with accessory nursing, sanitary, and other personnel in proportion to the population and area involved, and supported by local tax resources or with such appropriations as the community to be served can afford from its own local tax revenue, supplemented by state and federal funds. Neither federal nor state administration of health services, as these are generally accepted, includes primary responsibility for carrying out the local health program, since the major part of direct service to the people can be most efficiently and economically rendered on a community basis.

Neither federal nor state health services can function optimally unless local government accepts primary responsibility for the conduct of those six

* Suggestions for local health units in each state were presented with supporting data in graphic and tabular form at the Annual Meeting of the American Public Health Association in St. Louis, October 26–29, 1942. This progress report was approved by the Committee on Administrative Practice at its meeting in New York, N. Y., December 16–18, 1942.

† Resolution of the House of Delegates of the American Medical Association, June 10, 1942. Published in the *Journal of the American Medical Association*, 119, 10:811 (July 4), 1942. Resolution of the Governing Council of the American Public Health Association, Oct. 29, 1942. Published in the *American Journal of Public Health*, 32, 12:1412 (Dec.), 1942.

standard health activities * which concern directly and in some respects personally the birth, life, sickness, and death of each member of the family and community, and without which the application of preventive medicine through government to any effective degree is impracticable.

In some states the only full-time public health services are those administered and paid for wholly by state government. Wherever such state administrations provide substantially a full-time health service for county or district areas, these are separately listed.

The sources of information upon which the data here presented have been based are (1) for populations and areas of states and counties, the U. S. Bureau of the Census enumeration of April, 1940,† and subsequent Census Bureau estimates of the civil population as of May, 1942 †; (2) for the distribution of physicians in active practice and for general hospital beds, the American Medical Association; (3) for the effective buying income by states and counties for 1941, *Sales Management*, issue of April, 1942; and (4) for the location of full-time officers and other similar administrative data, the U. S. Public Health Service and communications from the state health officers.

Analysis of the tabulated material disclosed these significant facts:

A. In July, 1942, there were 62,032,300 persons (47.1 per cent) in 890 counties in 37 states and the District of Columbia for whom full-time health services were provided by local government in units of one or more counties or by individual cities within these counties.

B. There were 16,518,300 (12.5 per cent) other persons in 493 counties in 17 states for whom a full-time health service was provided by state government in single or multiple county units.

C. In the areas where full-time health service was not provided by either county or state government, there were 77 cities ‡ whose aggregate population of 12,066,100 (9.2 per cent) did receive full-time health service through city government.

D. There were, then, 41,052,600 persons (31.2 per cent) in 1,687 counties in 41 states for whom *no* full-time health service was provided, and 90,616,700 persons (68.8 per cent) in 1,438 counties in 46 states, the District of Columbia, and in 77 cities, for whom full-time health service was provided by a local, city or county, city-county, multi-county, district, or state health department.

Owing to administrative changes due to movement of health officers into the armed forces, and because of considerable and continuing shifts of population within and across state boundaries, these figures must be considered as approximate only at any particular subsequent date.

The following ideas are considered by the committee to be basic and are believed to be acceptable from the points of view of the professions concerned and of the public to be served:

1. No unit of population, large or small, and no square mile of area under our civil government should be without access to or coverage by the services of a professionally trained and experienced health officer, preferably a physician with appropriate associated professional and technical personnel and equipment, and facilities for transportation to all parts of the area of jurisdiction.

2. Local responsibility for the intimate personal protective and preventive services

* Registration, tabulation and analysis of births, deaths and notifiable diseases; Control of Communicable Diseases; Environmental Sanitation; Public Health Laboratory Service; Maternity and Child Hygiene; Public Health Education.

† The total population of the states and the District of Columbia, according to the Census of April, 1940, was 131,669,275. The *civil* population of the same area estimated by the Census Bureau for May 1, 1942, was 131,315,393.

‡ There were 93 other cities with a combined population of 24,181,600 in 82 counties where the county as well as the city populations were served by full-time health departments. These city and county populations are included among the 62,032,300 and 16,518,300 mentioned in paragraphs A and B above.

for health is a primary essential of a democratic form of government and it should be so specified under state statute. The health functions of local government must be clearly defined, the merit or civil service system must prevail in the selection and continuance in service of the employed personnel, and sources of revenue must be authorized to meet the readily calculable costs of at least a minimal program of local health service.

3. The factors of available professional personnel and of per capita cost of good health services make it appear likely that population units of less than 50,000 may not be able to obtain and support well qualified personnel, and will find it difficult to support a full-time local health unit. For administrative efficiency and economy, a full-time local medical health officer should be employed for population units of not less than approximately 50,000 each. For large units of 250,000 or more, assistant or deputy health officers will be required, often as directors of special activities, as, for control of tuberculosis or venereal diseases, for maternity and child hygiene, malaria control, etc.

4. An area of local health jurisdiction should be of such approximate dimensions that the average distance from the headquarters to the periphery does not exceed 25 to 40 miles.

5. In planning for the creation or development of units of local health jurisdiction, the factors of effective expendable income per capita, the number of persons per physician in active practice in the area and the number of general hospital beds per 1,000 of the population should be taken into consideration. In developing district outlines an endeavor should be made so to group counties or parts of counties as to reduce large inequalities in per capita income by combining urban and rural, high and low income groups in a single jurisdiction where otherwise desirable. Also, in combining counties or parts of counties within one district an attempt should be made to group them so that the ratio of physicians will not be less than 1 to 1,500 of the population and that the general hospital beds available for the community be not less than 3 per 1,000 of the population.

6. The personnel in addition to the medical officer of health believed to be necessary for a good local health service which conducts a modest but balanced program may be expressed by the following minimum ratios:

   a. One public health nurse for health department purposes to each 5,000 of the population. In each unit of 50,000 population, at least one of the public health nurses should be of supervisory grade.

   b. Two full-time persons in the field of environmental sanitation for each unit of 50,000 population, one of whom should have professional qualifications in this field, preferably those of a public health or sanitary engineer.

   c. One clerk for each 15,000 of population.

7. The offices from which local health service is administered should be housed in a permanent construction appropriate to the functions performed and the services rendered.

TABLE 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Alabama | 35 | Iowa | 36 | Nebraska | 20 | Rhode Island | 3 |
| Arizona | 7 | Kansas | 27 | Nevada | 3 | South Carolina | 24 |
| Arkansas | 29 | Kentucky | 41 | New Hampshire | 5 | South Dakota | 10 |
| California | 29 | Louisiana | 26 | New Jersey | 17 | Tennessee | 31 |
| Colorado | 13 | Maine | 10 | New Mexico | 7 | Texas | 80 |
| Connecticut | 7 | Maryland | 12 | New York | 37 | Utah | 6 |
| Delaware | 3 | Massachusetts | 10 | North Carolina | 48 | Vermont | 6 |
| Florida | 18 | Michigan | 40 | North Dakota | 11 | Virginia | 19 |
| Georgia | 44 | Minnesota | 26 | Ohio | 54 | Washington | 18 |
| Idaho | 6 | Mississippi | 36 | Oklahoma | 34 | West Virginia | 15 |
| Illinois | 47 | Missouri | 37 | Oregon | 14 | Wisconsin | 20 |
| Indiana | 35 | Montana | 15 | Pennsylvania | 49 | Wyoming | 6 |
| | | | | | | District of Columbia | 1 |
| | | | | | | | 1,127 |

If the principles above expressed so far as size of population and area of units are concerned be accepted, it will be found that approximately 1,127 units of local health jurisdiction will be needed for continental United States, of which 303 would be units of 1 county each, 677 units of 2 to 4 counties, and 147 of more than 4 counties each. It is to be understood that where a city is included within a county, only one unit of local health jurisdiction is to be recommended for both city and county populations.

The suggested numbers of units of local health services for the several states are as shown in Table 1:

Information has been prepared in tabular form giving for each state as a whole and for the suggested units of local health administration, the five items of information above referred to as determining or accessory factors, viz., Area, Population, Effective Expendable Income per Person, Ratio of Population to Practising Physicians, and Ratio of General Hospital Beds per 1,000 Population.

A summary of some of the more important and relevant facts follows.

Among the 48 states, within which there are 3,070 counties, there are 3 with less than 10 counties each (Delaware 3, Rhode Island 5, Connecticut 8), and 8 with 100 or more counties each (North Carolina 100, Illinois 102, Missouri 114, Kentucky 120, Georgia 159, Texas 254, Kansas 105, Virginia 100).

Populations and areas of the counties vary widely from 42 persons to more than 4,000,000, and from 22 square miles to 20,175 in a county. Each state has at least one county with less than 50,000 population and in 7 states the population of each county is less than 50,000, or but slightly more (Idaho, Montana, North Dakota, Nevada, South Dakota, Vermont, and Wyoming).

There are 28 states in which the largest county has an area of less than 2,000 square miles, that is, with an average radius from a geographic center of about 25 miles.

Among the 3,070 counties and the District of Columbia, there are now approximately 907 administrative health officers in charge of units of local health service under local or state control, serving the populations and areas of 1,383 counties and the District of Columbia. In addition there are 170 full-time city health officers, 93 of whom serve cities which are located in full-time county or multiple county units, and 77 serve cities located in counties with no full-time health service.

The committee offers the suggestion that by combining some counties with others, and by including cities and the counties within which they lie as city-county units for health services, to the end that administrative adequacy and economy be attained in the direction and operation of full-time local health services, a good quality of such service can be obtained for the entire population and area of the United States under 1,127 units of local health jurisdiction under the direction of 1,127 medical officers of health.

There are at present 7 states in which all counties have some form of full-time health service (that is, under local or state direction). These are Alabama, Delaware, Maryland, New Mexico, New York, Utah, and Wisconsin. There are 9 states without full-time health services for any county unit (Connecticut, Maine, Nebraska, Nevada, New Hampshire, New Jersey, Pennsylvania, Rhode Lsland, and Vermont).

There are 4 states each with 1 county unit of local health administration and no local units under state district health direction (South Dakota, Indiana, Massachusetts, and Wyoming).

The committee does not propose an extension of the single county unit system of local health administration, which

would be administratively and economically unsound for very large areas and sections of the national population and would call for an increase of approximately 2,000 administrative health officers. Nor does it advocate an extension of the state district system of providing local health service, except in such areas and for such sparsely settled portions of some states as make any really effective local or county government impossible, or at least improbable, for a long time to come.

The committee suggests, for the consideration of state health officers and of state medical societies of the respective states, such reorganization and extension of full-time local health service as may be needed to reach all their people and their total area, by applying well established criteria for areas of jurisdiction, for employment of personnel, for the conduct of standard health functions, and for the support of these activities from tax resources.

According to the suggestions of the committee as graphically presented on maps of the respective states, exhibited at the Annual Meeting of the Association in St. Louis in October, 1942, of the 1,127 proposed units in existence or to be developed, 303 would be single county units, 677 units would include 2 to 4 counties, and 147 would be units of more than 4 counties each. In several instances the unit could be best created by including parts of several adjacent counties rather than the entire counties because of the geographical inconveniences in transportation within strictly county lines.

Of the suggested 1,127 units, 117 would have populations somewhat less than 50,000; 749 units would have populations of 50,000 to 100,000; 188 units would be of 100,000 to 250,000; 49 units of 250,000 to 500,000; and 24 would be of more than 500,000 population each.

Of the 1,127 units, 99 would each have an area of less than 500 square miles; 255 would be units of 500–1,000; 412 of 1,000–2,000; 231 of 2,000–5,000; 76 of 5,000–10,000; and 54 would embrace areas of 10,000 square miles or more.

It would overload this report with figures if the data on expendable income, general hospital beds, and practising physicians by states and by the suggested units of local health jurisdictions were included, although these are available for interested persons through correspondence with the committee.

The committee plans to continue its activities in the following three main directions:

1. Extension of full-time local health service through conference and correspondence with appropriate officers of state government and with representatives of state medical societies and with other interested persons.
2. Analysis of existing statute law, and cooperation with such organizations as the National Conference of Commissioners on Uniform State Laws, to encourage the passage where necessary of enabling legislation permitting or requiring the establishment of local health services as a function of civil government throughout all the states.
3. Study of the quality and number of persons of professional grade needed in full-time employment for the conduct of at least a minimum local health program under the varied conditions of area, population, and economic status of the proposed units of jurisdiction, and preparation of estimates of per capita costs of such services based on experience in existing units. Furthermore, to estimate the number of persons, such as physicians in general and specialty practice, needed in part-time clinic, advisory, and consultative positions in local health units.

The committee hopes to be of service in making practical and effective the spirit and obvious intent of the resolutions adopted by the American Medical Association and by the American Public Health Association.

Local initiative and responsibility for

health protection are believed to be essential for national health in peace and in time of war. In this respect we are now but half prepared as a Nation.

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American Journal of Public Health
*and* THE NATION'S HEALTH
Official Monthly Publication of the American Public Health Association

Volume 33 April, 1943 Number 4

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## THE COMMISSION ON VITAL RECORDS

A REPORT of the federal government's Commission on Vital Records has just been released. This Commission stems from the Office of Defense Health and Welfare Service. It includes in its membership representatives of the War and Navy Departments, the U. S. Public Health Service, the Bureau of the Census, the Social Security Board, the Office of Civilian Defense, the Department of Justice, the Office of Price Administration, the War Manpower Commission, and state health officers. Dr. Lowell J. Reed, Dean of the Johns Hopkins School of Hygiene and Public Health, is Chairman.

In the development and utilization of vital records in the United States, we have gone through a number of phases, each reflecting a somewhat different approach to the matter. We have now passed well beyond that stage where collection and preservation of such records was a function limited to the church, and have made it a governmental responsibility, usually under health departments. Until recently, the utilization of these records has been largely in terms of their public health significance; only secondarily were they viewed as of evidentiary value in relation to place and date of birth, and parentage of the individual. However, in the past decade, birth certificates have been utilized more than ever before as evidence of these facts and it seems likely that this aspect of the vital records will become increasingly important as the results of social security legislation enter more largely into the life of the average citizen. The war, too, has emphasized the evidentiary value of birth certificates, in that proof of place and date of birth and parentage is demanded in many circumstances. However, heavy demands for certified copies of birth certificates have demonstrated that registration of births has not been nearly so complete as is desirable, that provisions for delayed registration of birth vary markedly in the different states, and that, in industries and even in different agencies of the federal government, there are varying requirements and standards which, when a certified copy of the birth certificate is unobtainable, an individual must meet in establishing age and place

of birth. It is further to be noted that an individual, having established these facts to the satisfaction of one state or governmental agency, has often been no better off as regards the final and permanent establishment of these facts of where and when he was born. Should he later, for instance, shift from employment from one state to another or from one government agency to another, he might find it necessary to obtain a completely new set of affidavits or other substantiating documents and perhaps some not previously required.

The aspects discussed above, of course, constitute only a part of the problems and deficiencies in the forty-eight quite separate state systems for the registration of vital records. These difficulties are recognized by most state health officers and, while there is no desire to replace the state and local systems by a federal one, it has for some time been generally agreed that the federal participation should be more exact, more far-reaching, more focused, and above all should serve as a coördinating element. It was a consciousness of these needs that caused the Conference of State Health Officers to request the Medical and Health Committee of the Defense Health and Welfare Service to appoint the Vital Records Commission, and the judgment of the Commission is reflected in the report under discussion. The Commission reports upon two problems which it considered: (1) The development of a scheme of national registration for purposes of identification of each individual, and (2) the need for a coördinated system of vital records for the United States. As to the first, the Commission reviewed the desirability of and the arguments against national registration in peace and in war, considered the technical difficulties involved, recognized that it would cost no inconsiderable amount and recommended that a national population registration establishing the identity of all people in the United States be carried out at this time if deemed essential to the war effort. The decision as to whether or not such an identification system is essential was beyond the authority of the Commission.

In connection with the second problem, the Commission went no further than to recommend that the existing vital records organizations of the country at national, state, and local levels be strengthened and coördinated into a system. It expressed itself as convinced that a single agency of the federal government should be solely responsible for federal participation in one or both of the undertakings having to do with vital records but it did not recommend which branch of the federal government should be so designated. A further recommendation was that the coördination of the registration systems be effected regardless of whether or not a national registration for identification is put into effect.

The Commission also expressed itself as somewhat concerned over the fact that there exists in the minds of many a confusion as to the functions of *identification, verification,* and *certification* as observed in connection with vital records; and believing that clarification is essential to an understanding of the differences between a system of vital records and a national registration system, the Commission in its report undertook to define these terms. It must be confessed, however, that the language in which the definitions are set forth in the report would be improved by a bit of editing. Possibly there were no lawyers present, or perhaps too many. But the report is a social document of unusual value and significance. It represents the distillate of many weary hours of work, of voluminous correspondence, of adjustments and reconciliations of opinions, and of hard thinking. We urge its study by those in public health and we take it upon ourselves to express to the Commission the appreciation of public health workers.

# IS THERE AN EPIDEMIC VOMITING DISEASE OF WINTER?

SOME two decades ago alert pediatricians were struck by the fact that from time to time in the winter months they were called upon to attend large numbers of children with unseasonable gastric disturbances. With these experiences, and on a somewhat *post hoc* basis, they became suspicious of milk that had, as it were, frozen on the doorstep. Some felt that, the expansion of freezing having raised the bottle cap, contamination had occurred. Others believed that the milk had undergone a physical change which made it indigestible. Then, in 1929, Zahorsky reported from St. Louis an outbreak which he designated as Hyperemesis Hiemis, or the winter vomiting disease. He stated that he had encountered similar epidemics off and on in the past 30 years, that the outbreaks tended to occur in the winter months. He published another article in 1940 and estimated that in St. Louis, in the period February 2 to February 20 of that year, there had been some three thousand cases of this winter vomiting disease. He did not subscribe to the frozen milk theory but came to the conclusion that the conditions existing in late fall, winter, and occasionally early spring, contributed to an unusual abundance of proteolytic organisms in milk, even though pasteurized; that it was the ingestion of milk heavily loaded with these putrefactive bacteria that caused the vomiting syndrome. In this report there is no evidence that Zahorsky made a detailed epidemiological study of cases as regards the ingestion of the milk in question nor are there any data to sustantiate a belief that the disease was in effect limited to those who drank such milk.

A more recent contribution to the literature of the vomiting disease comes from Waring who, in the September, 1942, issue of *The American Journal of Diseases of Children,* reports the vomiting disease as it occurred in Charleston, S. C., in the winters of 1941 and 1942. He estimates that the number of cases was in the thousands, with symptomatology essentially the same as reported by Zahorsky. In addition, many other outbreaks have occurred, some of which have been studied, but the majority were uninvestigated and unreported. Waring's observations would tend to offset Zahorsky's hypothesis that the causative factor is milk with a high content of putrefactive organisms, in that there appears to be no food or drink common to the Charleston cases.

The condition seems to be limited essentially to young children, although occasionally adults are affected. When there are multiple cases in a family, the outbreak is not explosive, as in food poisoning, but the individual cases tend to occur in sequence: One child has an abrupt onset, is ill for two or three days, then a second child is affected and possibly a third individual some days later. This causes one to speculate as to a period of incubation. High fever is not a characteristic, though usually there is a slight elevation of temperature. Zahorsky reported more than half of the cases to have a coincident upper respiratory infection. Waring found respiratory involvement unusual. The stools are loose, light in color, without pus or blood, with an offensive odor suggestive of putrefaction. The most characteristic symptom, however, is vomiting. In many instances this is violent, frequent, and excited by anything taken into the stomach. The disturbance lasts for from two to four days and, though the child sometimes appears quite ill and may give evidence of dehydration and rather serious exhaustion, fatalities are practically unknown.

In the outbreaks reported, it has seemed not practicable to obtain productive bacteriological and virus studies, nor have the conditions been such as to permit the

collection of detailed epidemiological data. More information is therefore needed before it may be concluded that one and only one cause is operative, that one and only one condition is being dealt with, that this one cause will produce only this one condition, and that this condition may be produced only by this one cause, etc. It may all be a mare's nest, sheer coincidence, a syndrome brought about by diverse causes, the by-product of a sore throat or, possibly that rock of refuge, "intestinal flu."

Epidemiologists who feel that there is little left for investigation might do well to keep alert as to the occurrence of the winter vomiting disease in their communities. Here is a chance to assist in obtaining an answer as to whether or not this is a clinical entity. If it is, is it infectious and how; and what is the nature of the infectious agent?

## LETTER TO THE EDITOR

TO THE EDITOR:

For some time now, I have cherished the opinion that the JOURNAL does not make statistical mistakes or indulge in bad statistical practice. I should like to comment, therefore, on a minuscule item on page 94 of the current January number, Vol. 33, Number 1. Under the heading "Epidemiologic Note" you quote an average incubation period of "12.2 plus or minus 1.1 days."

It is our practice to teach that the use of the $\pm$ following an average is distinctly undesirable, especially where it is not clear from the context what the number following the $\pm$ stands for. That number is usually the probable error of the average in question, although there are instances where it turned out to be the standard error. In either instance, I venture to say, the meaning of the $\pm$ term is not clear to the average reader, and for that reason it had best be avoided.

Referring to the article you cite in the *J.A.M.A.*, and without attempting to reconstruct the calculations based on the data presented, it may be assumed that the average of 12.2 days has a probable error of 1.1 days. Strictly this should be interpreted to mean that if the true average incubation period for *all* cases were 12.2 days, and if sets of observations similar to those presented could be made repeatedly, the averages could be expected to vary due to chance alone so that only 50 per cent of them would lie between $12.2 - 1.1$, or 11.1 days, and $12.2 + 1.1$, or 13.3 days. The remaining 50 per cent of the averages would be expected to lie outside of this range, i.e., below 11.1 days or above 13.3 days. Moreover, it is not known that the true average is 12.2 days, and by reasoning from the above it could easily be as low as 8.9 days or as high as 15.5 days (three probable errors below or above the observed average), assuming a normal distribution of incubation periods. In other words, if the true average were 8.9 days, the average of 12.2 days observed here could easily have occurred due to chance variation alone. Similarly if the true average were 15.5 days.

In a group of 37 cases therefore, one should not be surprised to find an average anywhere from three probable errors below the lowest likely true average to three probable errors above the highest likely true average, namely, between 5.6 days and 18.8 days. Unfortunately, very few readers would instinctively place this interpretation on the expression "an average of $12.2 \pm 1.1$ days." I believe it is safe to say that most per-

sons would simply conclude that the average may vary from 11.1 to 13.3, and no more, which would be incorrect.

In order to avoid misleading the uninitiated, I believe one should merely state that an average of 12.2 days was observed, and that this average had a standard error of 1.6 days (the figure from which a probable error of 1.1 days must have been derived). A careful reader would then make it his business to understand the meaning of "standard error." The use of the notation "±" followed by the value of one probable error does not convey the thoughts of modern statistical reasoning. It should be considered as out-of-date as the idea of keeping our screened windows shut tight at night in order to avoid malaria. I should like to suggest that the JOURNAL promote the education of the average reader in this respect as it does in so many other respects.

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# Report of the Chairman of the Executive Board to the Governing Council*

TWELVE days after Pearl Harbor, the American Public Health Association, through its Executive Board, made a declaration for the fourth time since its foundation in 1872 of its professional aims in the interest of national health. The declaration had behind it the urgency of the days immediately following December 7, when every American took counsel with himself and asked "What can I do?"

It seemed imperative to remind public health workers that they might show the highest standard of practical patriotism by staying on their jobs. It seemed imperative, too, to state in terms of the present, because of their vastly heightened need, certain long-term objectives with respect to official health organization in the United States. This was intended to suggest a wartime platform for the public health profession.

The Declaration read in part:

"While health officers and health departments, state and local, city and rural, are expected always to be on duty to fulfil urgent and enduring needs of every population unit and area under the jurisdiction of civil government, the state of war calls for a clarification of aims, some simplification of organization, and a considerable strengthening of effort to develop and keep fit a nation of superior men, women, and children, capable of an optimum life within the privileges and duties of free peoples. . . .

"Our one first aim is victory for the United Nations, and to this end, we, as a body of public servants, pledge all the resources of our professional and technical capacities.

"Any neglect or curtailment of the essential protection of civilian health, whether at home or in the factory or other work place, is inconsistent with maximum efficiency of the military forces.

"The trained civil health worker is properly considered indispensable to the maintenance of national health, and he should be encouraged to continue at his regular station in civil government unless it becomes perfectly clear that the war can be more effectively prosecuted by his transfer to military service.

"Those states and more limited areas now wholly or in large measure lacking the reality and, in some instances, even the form of responsible health service by trained and experienced health officers, devoting their entire time to the public need, and to enforcing the reasonable and necessary provisions of sanitary and public health law, should with all speed be provided with health officers competent to give leadership and direction, and authorized to spend public funds sufficient to make health services a reality for every unit of population and for every area of civil jurisdiction.

"The effective modern health department, as now conceived and at present organized in many states, cities, and counties as a branch of civil government, comprises a medical, sanitary, and related biological and social competence which enjoys broad authority to meet a wide variety of medical and environmental emergencies.

"Where such an organization exists and has under control the preventable factors related to disease and death, the health officer and his staff must be alert to extend, and, if necessary, to modify the usually accepted health functions to meet the multitude of exceptional situations certain to be created by the state of war and by the mobilization of all the people and their industry to support the armed forces.

"In spite of the fact that the creation of authority and organization of health resources of the respective states and insular and territorial jurisdictions on a centralized basis under the federal government appears at present to be neither desirable politically nor

* Presented at the Seventy-first Annual Meeting of the American Public Health Association in St. Louis, Mo., October 26, 1942.

practical legally, nevertheless, the American Public Health Association recommends and urges upon the health officers of every jurisdiction of civil government in the United States, that they think of themselves as conducting an essential portion of a national project for the people's health and acting at all times as if they were in fact and within the law at the administrative disposition of the Surgeon General of the United States Public Health Service.

"If we will accept and act with vision and confidence upon the principles and policies here declared, it will appear that what is needed for victory in arms will be provided for both military and civil portions of our population without sacrifice of the continuing and progressive health needs of a people devoted to the humanities of peace." *

Twelve days after Pearl Harbor, the Executive Board devoted many hours to a discussion of the obligations and responsibilities of the American Public Health Association, as the recognized organization of the public health profession in the national crisis. The conclusion was finally reached that the Association would more appropriately carry on its routines, responding to calls upon it as occasions might demand, than to set up a predetermined plan of immediate and future action.

It was the conviction of the Board that, as mobility and maneuverability are very valuable characteristics of our war machines, so are they in a professional society working in a sphere where there are as many variables as exist in public health. The Board saw its duty as that of keeping our professional society in a position to swing into action on demand, and to be ready, at a moment's notice, to direct our professional strength against any salient that might be assigned to us.

This decision, too, is found to have been wise.

The pattern of the Association's work during this wartime year has been adjusted to these decisions of the Executive Board. We have moved to closer and closer identification with the war. Documentation will be found on every page of the program of this 71st Annual Meeting and throughout the agenda for the meetings of the Governing Council.

As Americans and as public health workers we have witnessed and have been affected by the national readjustment from pursuits of peacetime to armed conflict. No aspect of the transformation has been without special significance for the public health worker. Think for a moment of a few of the new words and phrases which are in general use, and consider the public health worker's concept of them and that of the general public. "Defense area" and "critical area" awaken his professional instincts, conveying to him more than the fact that business is booming. "Rationing" of food, of fuel, and of some critical materials means shortages and inconveniences to the public but, to the health worker, they mean possible health hazards. Rehearsals of procedures to be followed in case of "air-raids" are coming to be common practice. No one better than the health officer realizes how much more than the rescue and treatment of "casualties" would be involved in the bombing of a community. The phenomenal "defense plant" wages made possible by long work hours are not cause for jubilation to the health worker, nor are the lowering of standards for working conditions and for occupational age levels. His problems increase with the building of the new airplane factory on the edge of town, although it brings a seeming prosperity to the townspeople. Plans for "evacuation" of populations, or of mothers and children, are being worked out in many places, with frequently unacknowledged, but ultimately great dependence upon the health personnel of the areas. And, while the nation has been absorbing the full fact of war, while the new situations with all their

* *A.P.H.A. Yearbook*, 1941–1942 (Supp. to *A.J.P.H.*, Mar., 1942, p. 40.

important implications for health workers have been expanding our vocabularies, our trained public health workers, never ideally numerous in ordinary times, have been and are being increasingly drawn for service in the armed forces. These facts have not been outside the focus of Association interest.

It is inevitable that the awareness of public health workers to these problems and their attempts to cope with them should be the very fabric of the 1942 meeting of the Association. What will be said will encourage, or some of it may depress us, but certain it is that we start forces in motion here, for better or worse, which will not be spent for months and years to come.

Recognition of the authority of the Association has come from many sources this year. The Army and the Navy have purchased hundreds of copies of *Standard Methods for the Examination of Water and Sewage*, and *Standard Methods for the Examination of Dairy Products*. The volume on *Diagnostic Procedures and Reagents*, among other Association publications, has been microfilmed and flown to China for use in war areas. A condensed version, in Spanish, of *Standard Methods for the Examination of Dairy Products* is under discussion as a result of frequently expressed need by health workers in Latin American countries. The American Red Cross has designated the *Report of the Committee on the Control of Communicable Diseases* as an essential item in the equipment of its instructors in first aid. Another interesting fact about this report is that its placement in the hands of all the state health officers early this spring resulted in not a few revisions of communicable disease regulations and a wide distribution of the report which has been reprinted by the United States Government. The Tolan Committee on Defense Migration of the Congress called representatives of the Association to testify before it. The U. S. Public Health Service published, as *Reprint 2359* from *Public Health Reports*, an appraisal technic for urban problem areas as a basis for housing policy of local governments, a report of a subcommittee of our Committee on the Hygiene of Housing. One need only scan the numerous published summaries of happenings in public health and related professions, and examine bibliographies supporting articles appearing in books and periodicals which serve many varied fields, to see how heavily the authors have leaned on the JOURNAL and other Association publications. These examples are a very few of many that might be cited.

We have said that progress can be reported toward putting into effect certain recommendations in our latest official declaration of policy. One of these was "clarification of aims." The JOURNAL may be credited with accomplishing some of that. Responsible for the wise selection of articles and the interpretive editorials are Dr. Harry S. Mustard, the Editor, an office he has distinguished for nearly two years, and a group of associate editors which was enlarged during the year to bring even more special skills into publication counsels. "Some simplification of organization" was another recommendation. A recently appointed and very active Subcommittee on Local Health Units of the Committee on Administrative Practice, under the Chairmanship of Dr. Haven Emerson, is now at work with this end in view. It is studying the present status of locally governed health units in the United States and will propose a redistribution of area and population, under full-time health units, which will be consistent with good administrative practice. The first report of the committee * will be made at this meeting in the form of an exhibit of state

* See report, page 404, this issue.

maps, showing present areas of local health administration and proposals for health units under full-time medical health officers. Although these suggested groupings of area and population are of a tentative and provisional nature, they serve better than any previous attempt as a basis for discussion of the number of doctors, engineers, nurses, and other specialists which will be required in any adequate health program for the nation and, as well, the number of persons of such training which should be withheld, for national safety, from military service. It is gratifying to note the common interest in this field of investigation between the American Public Health Association and the American Medical Association. The House of Delegates of the latter organization has recently passed a resolution signifying its belief in the need for, and its intention toward implementing, such a study as our committee has now undertaken.

A third recommendation was "a strengthening of effort." This is a matter for the individual health worker, for committees and sections in his professional society, and for the society itself, where individuals, committees and sections are extended, and where interplay and teamwork of the whole are made possible. We shall have evidence at this meeting of how much strengthening of effort has been achieved.

As for our routines, and they are described thus only to differentiate them from activities begun or strikingly altered during the year upon which we are reporting, they go on—showing constant growth and development as they have for several years past. I refer to the promotion and maintenance of membership, the Employment Service, the Information Service, the Book Service, and other projects which render service to the membership or which add to our revenues in order that the membership may be better served. We have announced in successive reports membership figures that exceed those of the year before. We have pleasure in doing it again. The number of members and Fellows on the rolls on the first of September, 1941, was 7,108; on the first of September, 1942, it was 7,489, again an all time high.

The attention of the Governing Council was drawn last year to the extraordinarily high qualifications among many of the applicants for Fellowship whose names were presented for Council action. We said that this augured well for Association leadership. It is possible to speak with equal pride of the 139 Fellowship applicants whose names will come before you this year. It is a testimony to the growing prestige of the Association that 468 persons have asked and received this recognition at the last five annual sessions. The higher standards imposed by the Governing Council during this period have resulted in more than doubling the number of applicants.

Several new Association publications have appeared during 1942, among them the first section of an extensive report on lead poisoning, by a committee of the Industrial Hygiene Section, and a report on bathing places by the Joint Committee of the Conference of State Sanitary Engineers and our Engineering Section. *Community Organization for Health Education*, a report of a study of a committee of the same name, made possible by a grant from the Charles H. Hood Educational Trust, was widely accepted, and the entire edition of 10,000 copies was distributed. The Committee on Professional Education has issued additional reports on educational qualifications of several categories of public health workers.

The Association during the year has been actively identified in the developing program of the National Health Council and its Committee for the Study of Voluntary Health Agencies. An appropriation for this purpose over a three year period has been made by the

Rockefeller Foundation, and Selskar M. Gunn, Vice-President of the Rockefeller Foundation, has been given leave to direct this study. Association channels have been useful in the early months of this work to promote an understanding among health workers as to the purposes of the study and to open doors locally for Mr. Gunn and his associate Philip Platt, Ph.D., recently of Honolulu. The work of this committee will be the subject of a general session at this meeting. It is to be hoped that out of the study there may come a new orientation of voluntary agencies in the American scene.

In connection with the current widespread desire to promote hemispheric relations among the republics in this part of the world, it is interesting to recall that 1942 marks the 40th anniversary of the formal identification of the Republic of Cuba with the American Public Health Association, and, as well, the 50th anniversary of the extension to Mexico of the Association's sphere of influence. This is no new program for the American Public Health Association. It will be recalled that, at the 70th Annual Meeting in Atlantic City, no less than 44 representatives were present from Latin American countries, thanks to the coöperation of the Pan American Sanitary Bureau and the Coördinator of Inter American Affairs. It was a fine opportunity to build strong bridges of understanding in the applied science of public health. It is hoped that the invitations extended to these countries again to be represented at this meeting may be accepted. The Chairman of the Executive Board had the opportunity in person to present recently at the meeting of the Pan American Sanitary Conference in Rio an invitation to his colleagues, with special reference to the public health engineers, among whom there is increasing evidence of the shift of their interest to North America.

It is worthy of note that the official agencies responsible for the organized effort of promoting understanding between the republics of the Western Hemisphere have adopted projects in public health as an opportunity to express the growing interest and the cooperative support for this part of our common destiny. Well qualified leaders among those identified with the American Public Health Association are responsible for the health aspects of this program. If any further evidence were needed of the acceptability of public health as a means of promoting national and international welfare, this adoption by official agencies of the technics long used by this professional society and by the foundations is outstanding.

There is currently under discussion the desirability of preparing an abbreviated document summarizing the steps in the laboratory examination of milk as outlined in the 8th edition of *Standard Methods for the Examination of Dairy Products* and for the translation of this digest into Spanish, in order that the technical staffs as well as the directors of these laboratories in Spanish-speaking countries may have access to this American Public Health Association standard with its increasing international significance.

It is not the purpose of this report on behalf of the Executive Board to encroach upon the special fields of interest of the standing committees, on which there will be formal reports by the respective chairman. Mention must be made, however, because of its significance from the standpoint of Association policy, of the present status of the Merit System project. Begun more than a year ago on a modest basis, this effort to prepare examination questions for workers in the various public health specialties has expanded until it is now possible to estimate something of the scope and importance of the venture.

Originally started at the request of

the U. S. Children's Bureau and the U. S. Public Health Service, this venture grew out of a recognition of the lack of competent materials for the examination of professional workers in public health. In an effort to apply what is good practice in personnel administration and examination technic, a study was begun and questions were developed in the field of public health nursing.

Through the generosity of the Children's Bureau, which loaned a staff member, and with the coöperation of several state health officers, funds were made available for this study and a staff was employed which has now developed questions for public health nursing of the objective type to the number of more than 2,000. These have been made available to several state merit system councils on request and are accessible to all such agencies on a non-profit basis.

The success of the nursing questions has been such that the project has now moved into the field of preparing material for the examination of administrative health officers, and we hope soon to explore the field of environmental sanitation and the field of the laboratory. It is necessary for this purpose to maintain a staff of test technicians and subject matter specialists, and continually to secure the counsel of young and imaginative workers of the better sort.

Assured of splendid coöperation from the members of the public health profession, this project can be expected to move into new ground and to continue to realize the expectations which the Committee on Professional Education, the Executive Board, and the Governing Council have hitherto expressed, believing that this is one of the most productive and fruitful enterprises with long-range relationships to the quality of public health work which the Association in its long history has ever sponsored. Opportunities will be afforded at this Annual Meeting to extend the understanding by public health workers of this venture.

### FINANCIAL STATUS

The financial status of the Association again gives cause for satisfaction. The year ending December 31, 1941, was closed with a small surplus, and for the first nine months of the current year both estimates of expense and income have kept approximately within the budget adopted by the Executive Board in December, 1941, which anticipated total expenditures for the year of $162,212.35, and total income of $162,386.67. Increases in the expense of JOURNAL publication due to printing and paper costs represent the only substantial deviation from these estimates. An increased circulation has put an even greater strain on these items in the budget but it is expected that the overall balance will be not unfavorable. It is reasonable to expect, we think, that these estimates will stand until the Executive Board is able to review the experience of eleven months when it meets in December, and in particular, to know the result of this Annual Meeting which is the largest variable item in the budget and about which we must make our estimates conservatively.

### ACKNOWLEDGMENTS

Once more it is my pleasure to congratulate all who have given service in this coöperative enterprise which is the American Public Health Association—the members of the Governing Council, of the Executive Board, the officers and sectional committees, the standing committees, or those who have helped in some other capacity to make this 70th year important in Association annals.

We bring sincere thanks to those individuals and agencies who have provided funds for Association purposes without which a good deal of our work could not have been done this year—or

any year. The following list of sustaining members of the Association represents, in the aggregate, an item which is 11 per cent of our membership income, and which has helped beyond any other single category of the membership to sustain the Association through lean years and to provide a backlog at all times that has made possible many of the objective achievements of this professional society:

The Chlorine Institute, 30 E. 42nd Street, New York, N. Y.
Mrs. Moses H. Cone, 1800 Eutaw Place, Baltimore, Md.
Equitable Life Assurance Society, 393 Seventh Avenue, New York, N. Y.
The Gilliland Laboratories, Marietta, Pa.
International Association of Ice Cream Manufacturers, 1105 Barr Building, Washington, D. C.
John Hancock Mutual Life Insurance Company, Boston, Mass.
Life Insurance Company of Virginia, Richmond, Va.
Metropolitan Life Insurance Company, New York, N. Y.
National Life Insurance Company, Montpelier, Vt.
The Prudential Insurance Company of America, Newark, N. J.
Sun Life Insurance Company of America, Baltimore, Md.
The Travelers Insurance Company, Hartford, Conn.
Union Central Life Insurance Company, Cincinnati, Ohio
Western and Southern Life Insurance Company, Cincinnati, Ohio

To our advertisers and our commercial exhibitors, many of whom are long-time and faithful friends, we express our appreciation for continued interest and support.

In addition, I wish to thank the W. K. Kellogg Foundation, the Commonwealth Fund, the Metropolitan Insurance Company, the Milbank Memorial Fund, and the John B. Pierce Foundation for contributions which have made possible the rural and city health conservation contests, the work of the Committee on State Studies, the work of the Committee on the Hygiene of Housing, and other activities to which reference is elsewhere made.

The large amount of work accomplished by the Association during this past year reflects the earnestness, enthusiasm, and hard work of Dr. Reginald M. Atwater, the Executive Secretary, and his staff of loyal workers. The Association is deeply grateful to this group which has served so quietly, smoothly, and effectively.

So, in brief summary, stands the 70th year of the American Public Health Association. To the record there should be added the twelve issues of the *American Journal of Public Health*, the 1941–1942 *Year Book*, the 20th edition of the *Bibliography on Public Health and Allied Subjects*, *News Letters*, *Proceedings of the Eighth Institute on Health Education*, and other periodical publications of the Association. Even then one must admit that the most vital contributions of this society lie in an intangible realm, where the growth of our leadership and prestige is to be found. It is a good record to mark this anniversary year of the Association.

ABEL WOLMAN, DR.ENG., *Chairman*

# Administrative Practice*

THE Committee on Administrative Practice acknowledges with gratification the leadership of Dr. Eugene L. Bishop who served as its Chairman from 1937 through 1941. The record of the committee's activities during this period is a splendid tribute to his far-sighted guidance.

During the past twelve months, the program of the Committee on Administrative Practice, which begins its 23rd year at the 71st Annual Meeting of the American Public Health Association, has been divided into three categories:

1. Conduct of Special Studies and Services
2. The Analysis and Evaluation of Administrative Practices
3. State Studies and Consultation Service

## SPECIAL STUDIES AND SERVICES

The interest of industrial and trade organizations in industrial hygiene and the activities that are being sponsored in this field have been fostered, in no small measure, through the interest and activities of the Subcommittee on Industrial Health Studies during the past several years. This group has attempted to publicize the value of applying the health appraisal plan to industry.

At the December meeting of the Committee on Administrative Practice in New York, this subcommittee felt that its original purposes had been fulfilled, and suggested the possible desirability of its discharge. The Committee on Administrative Practice, however, believed that it was essential for the Association to promote activities in the field of industrial hygiene during the national emergency period and in the post-emergency period. It was therefore decided that this subcommittee would be continued and that its personnel be augmented or reorganized and its program broadened as the situation warrants.

The Subcommittee on Public Health Nursing which functions as the Committee on Nursing Administration of the National Organization for Public Health Nursing has proceeded with a study of nursing services in clinics. The field work for this study has been supplied by consultants of the U. S. Public Health Service and the Children's Bureau. Information based on a special schedule has been collected and is in the process of tabulation for approximately 200 types of clinics in various parts of the country.

It is anticipated that a report on this study will be released by the end of the year. This subcommittee proposes to make public this information as soon as possible since it is believed that it will be of assistance to agencies faced with making administrative changes due to the war effort.

The Study Committee, of the Subcommittee on State Health Studies, which has been concerned with the Development of Principles and Criteria for the Allocation of Public Health Funds from the State to the Municipal and Rural Health Units has held its activities in abeyance in the past several months on the recommendation of the chairman.

The Subcommittee on Manual of Practice and Appraisal of Local Health Work is collecting information for the revision of the *Appraisal Form for Local Health Work*, but it will in all

* Report of the Chairman of the Committee to the Governing Council, October 26, 1942.

probability not publish the final revision until the war is over.

The Study Committee on Sanitation has now completed a *Special Sanitation Appraisal Form for Local Health Work*, and the preliminary trial of this form has been approved when and if funds can be secured which will make this possible.

A new Subcommittee on Local Health Units was recently appointed to attempt to determine how many health officers were actually needed for local health jurisdiction on a full-time basis in order to render adequate service for all areas of the country. It was felt that until such an analysis was made there would be no way in which to determine how many physicians and other personnel with special health training should be held out of military service, if possible, in order to insure reasonable health services for the country as a whole.

### ANALYSIS AND EVALUATION OF ADMINISTRATIVE PRACTICES

The Measles Studies have been continued and a report on these was presented at a meeting of this Subcommittee on Evaluations held during the Annual Meeting. Tests of specific pertussis antigen for skin reactions have been made during the past year and were also reported on at the meeting of the subcommittee just referred to.

The Goiter Study Committee has carried on active conferences and study work and has been attempting to prepare a report on which a statesmanlike and effective national program for goiter prevention can be based. The report of this committee was also discussed at the meeting.

A report of the five year studies on diphtheria was published in the July, 1942, issue of the *American Journal of Public Health*.

Another evaluation study which is being conducted on a limited scale is that promoted by the Subcommittee on Organized Care of the Sick. This group has been largely concerned with the problem of public medical services as exemplified by the provision of medical care to recipients of public assistance and to the medically needy. A brief questionnaire on the administration of general medical services by health departments has also been prepared, and information is being secured by the Field Staff of the American Public Health Association during their regular field trips. It is hoped that in due time sufficient information will be available to permit a careful analysis.

The annual City and Rural Health Contests, recently renamed the "National Health Honor Roll," were announced in June. The *Fact-finding Schedule* has been further revised and is now known as the "Evaluation Schedule." Last year's revision demonstrated the value of the new schedule as a stimulating tool for the progressive health officer. Now refinements have been made as a result of one year's experience.

The need of good citizen health in wartime has stimulated activity in the National Health Honor Roll and the enrollment records to date are as follows: There are 150 individual cities and 350 counties enrolled, each of the latter has at least one city in its area. Therefore, including only the county seat in the participating counties the total number of entries is 500 cities and 350 counties.

A four page miniature newspaper devoted entirely to the Health Contests—now the National Health Honor Roll—is issued monthly, and the health officers have been very coöperative in preparing material for it. The value of this little paper as a means of exchanging ideas and telling of results of participation has been amazing. In order further to stimulate interest, those cities and counties which attained the National Health Honor Roll last year

will be carried on the Honor Roll for at least two years without the necessity of filling out the complete *Evaluation Schedule*, provided they satisfy the Grading Committee that their programs have not retrogressed.

### STATE STUDIES AND CONSULTATION SERVICE

During the past year, under the sponsorship of the Subcommittee on State Health Administration, the States of Illinois and Washington were studied. A request for a survey of West Virginia was also accepted by the Subcommittee, and preliminary work was started in the state but because of a serious depletion of professional personnel in the State Health Department, it was finally decided not to continue the study at this time. This decision was accepted by the State Department of Health, and the West Virginia Public Health Association as well as by the Subcommittee on State Health Administration.

In addition to the two new states studies, continued advisory service was given to Oklahoma, Florida, and Manitoba. Considerable service was also given in Michigan, but since this was financed by the W. K. Kellogg Foundation it cannot be considered consultation service in behalf of state studies, but it is hoped that the work may have a beneficial effect upon public health practice in that state.

A highlight of the state studies project during this year was the governmental meeting called by the Premier of Manitoba shortly after the report of that study had reached the members of Parliament. The field director of the American Public Health Association was invited, and a discussion of the recommendations of the study lasted over four hours. This meeting resulted in effective action. The provincial legislature increased its public health appropriations by over $60,000 (a substantial amount in Manitoba) to carry out the more important major recommendations.

A study of "Public Health in the Oranges and Maplewood, New Jersey" was made with the coöperation of the National Organization for Public Health Nursing, at the request of Community Chests and Councils, Inc.

Under the auspices of the Committee on Administrative Practice, at the request of Community Chests and Councils, Inc., and the Columbus Community Chest, Professor Ira V. Hiscock completed a public health study in Columbus and Franklin County, Ohio, which has already produced gratifying results.

In summarizing the activities of the Committee on Administrative Practice during the past year, it is apparent that every effort has been made to promote and carry on its program in such a way as to make available all the resources of its facilities to the war effort. The Information Service which it conducts for the Association has been able to assist various branches of the army and navy in securing certain types of information. The entire program of the committee, although it has not been set up on a wartime basis, has been sufficiently flexible to embrace whatever activities, within its scope, might be of general use at this critical time.

The greetings of the committee are extended to its many friends. Its appreciation for the assistance of those who have helped in its promotion in the past year is best expressed in its resolve to expand its program further in whatever way will be of most assistance in the promotion of public health.

HENRY F. VAUGHAN, DR.P.H.,
*Chairman*

# Professional Education*

ON October 25, 1932, ten years ago yesterday, the Governing Council approved an amendment to the By-Laws which resulted in the birth of a new standing committee to be known as the Committee on Professional Education. Today, as we celebrate the tenth anniversary of this committee we rededicate ourselves to the task of "carrying out research and the development of standards for professional education and training in public health . . . with a view to maintaining professional qualifications of high standard"—a charge bestowed on us at our birth.

While we are aware of our infancy in the family of the Association's standing committees, we believe there is justification for our pride in the accomplishments which the years have produced. I refer to the formal reports which have received the blessing and approval of this Council. Much effort has gone into the making of these reports, and at times it has seemed as though the obstacles were insurmountable. It is a tribute to the men and women who have served their Association so well as members of this committee and its subcommittees that the general acceptance of these reports has become an established fact. Many of you will recall the controversy that raged around the Report on the Educational Qualifications of Health Officers. Today it stands as an accepted document by the profession. Similarly, the reports dealing with educational qualifications of public health engineers, sanitarians, subprofessional field personnel in sanitation, statisticians, nutritionists in health agencies, school health educators, and industrial hygienists, emerged from controversy as sound contributions to "professional qualifications of high standard."

Lest it be thought that in our satisfaction at these accomplishments we are content to accept your approval of a report as carrying with it a stamp of finality, I mention again our established policy of reviewing these statements from time to time and revising them as the need arises. As evidence of this intent we shall ask you today to withdraw a report which you approved in 1938, because we are convinced that it has already served its usefulness and the changes brought by time have made it desirable that a new report be drawn up. We shall also ask your approval of a revised report on "Recommended Qualifications for Public Health Nursing Personnel."

Even though the members of this committee are so widely scattered geographically that it is not possible to hold more than one interim meeting between Annual Meetings, it is always a source of satisfaction to note the large attendance at these sessions and the inherent interest in the committee's affairs by its membership. It is particularly gratifying to note the deep interest of several members of the Executive Board whose attendance at these meetings has become more and more frequent.

When last we met in April, a careful review and evaluation of our procedures was made. Your committee faced realistically the fact that there will be a tendency to lower educational qualifications because of the current shortage of professional personnel. With confidence in the future, however, the committee expressed its belief that it should continue to aim at high standards rather than risk the effects of incompetence if

* Report of the Chairman of the Committee to the Governing Council, October 26, 1942.

standards were lowered. We recognize the fact that temporary expedients may have to be resorted to by some health departments during the early war period.

On the theory that all those who choose public health as a career should have basic training in public health, the committee agreed on the principle that, for the time being, professional education should be considered to mean public health training at the graduate level, or subsequent to basic or legally recognized professional training.

A uniform outline for the preparation of all future reports has been adopted, as well as a routine of procedure for dealing with subcommittee reports. These, we believe, will provide the Council with mature reports reflecting the maximum agreement obtainable among all interested parties.

A most significant statement was issued by this group as a memorandum entitled "Minimum Educational Facilities Necessary for the Postgraduate Education of Those Seeking Careers in Public Health." This statement was published in the JOURNAL* and was sent to the dean of every medical college, to all schools of public health, to university presidents, as well as to other influential groups. We believe this document has important bearing on the situation which we face today in the education of those who will be the professional leaders of tomorrow.

We feel that this statement is sound for the time being, and that it is of considerable current importance to those contemplating the establishment of schools of public health, as well as those seeking good public health training.

Pursuing its policy of coöperation with other groups, the committee has worked closely with the Committee on Teaching of Public Health and Preventive Medicine of the Association of American Medical Colleges. This latter group in April brought to your committee a report which covered findings and conclusions as to the present status of teaching preventive medicine and public health to medical students. It is hoped eventually that the committees involved in these Associations may reach certain definite principles and approach a report that can be submitted to and approved by both associations. At the session of the Committee on Professional Education, Dr. Wilson G. Smillie, *Chairman* of our Subcommittee on Teaching Preventive Medicine to Undergraduate Medical Students, will report on the actions taken by the Association of American Medical Colleges in regard to this problem, which will be discussed in Louisville, where Dr. Smillie is in attendance.

Another organization with which your committee has established a fruitful relationship is the Association of Schools of Public Health. Our Subcommittee on Field Training Centers has already made plans for join consideration of its problems. The committee has thus cultivated studies and discussions beyond its immediate purview.

There are now pending before your committee reports dealing with the educational qualifications of health educators, laboratory personnel, maternal and child health specialists, specialists in mental hygiene and in cancer control, and public health dentists. These reports have been prepared in accordance with our newly adopted policy, and it is anticipated that by this time next year we shall be prepared to ask for your approval of them.

During the year two new subcommittees were set up, one to deal with qualifications of school physicians and the other with executives of voluntary health agencies. Both of these are already at work on the preparation of their reports.

While no conclusion has yet been

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* *A.J.P.H.*, 32, 5:534 (May), 1942.

reached as to whether the certification of all public health personnel is a proper function of this committee, nevertheless serious consideration is being given to an interesting project developed several years ago by the Canadian Public Health Association for certifying sanitarians. We shall have more to report on this subject at a later time.

The Governing Council is not unfamiliar with the beginnings of the Merit System Study which have been reported at two previous meetings. The Governing Council, the Executive Board, and the Committee on Professional Education have all been emphatic about the importance of such a project in order that the present effort to implement merit systems in each of the states may not fail. It is a pleasure to report that during the last year this project has become productive and preparation of examinations in the first of the public health specialties has been undertaken.

Through agreement with the original sponsors of this project, the U. S. Children's Bureau and the U. S. Public Health Service, it has been decided that the Association should focus on the preparation of examination materials for use by the state merit system councils. With the assistance of several coöperating state health officers, and through the Conference of State and Territorial Health Officers, funds adequate for the first year have been made available for this project and the federal services have been generous in loaning personnel and providing other assistance.

Systematic work since the first of the year 1942 by a staff of subject matter consultants and a test technician has resulted in the preparation of an excellent list of items for public health nursing personnel which are now available to the number of about 2,000. Even more important, however, has been the educational process by which members of the public health profession have become familiar with modern methods in personnel administration and in examination technics, so that groundwork has been laid by which items in many other fields can the more rapidly be prepared. Staff members of this unit are present at the Annual Meeting, prepared to counsel with those in the several states having responsibility in this field, and it is apparent that there will be a considerable demand for these services in the immediate future.

The attention of the Council is called to the fact that this procedure under the auspices of a professional society is unique and it is hoped that the quality of the resulting examinations will justify the confidence which the responsible federal agencies have placed in the American Public Health Association.

With the funds already available, and in anticipation of contributions to be made by the states that use the service, the committee plans to proceed with examination materials in the fields of administration, environmental sanitation, and the laboratory.

The Committee on Professional Education has pride in presenting this progress report of a very concrete service to the public and to the profession.

As the Committee on Professional Education enters its eleventh year, we do so with confidence in the future of professional education, not only for ourselves but for all those peoples to whom democracy is a cherished ideal. Again we are grateful that we have been given the opportunity to make some contribution to the lofty objective of this professional society—the protection and promotion of the public health.

W. P. SHEPARD, M.D., *Chairman*

# Research and Standards*

THE year through which we have just passed has been one of increased activity for the members of the public health profession. Many of those who have served on this committee and who have contributed to the work of its subcommittees have been called to the armed forces. They have taken with them many of the technical procedures with which this Association can be credited and are making their benefits available to the war effort.

The Report of the Executive Board to the Governing Council has covered many of the items with which this committee is concerned. Among them are the extensive use by the Army and Navy of *Standard Methods for the Examination of Water and Sewage* and *Standard Methods for the Examination of Dairy Products*. The volume on *Diagnostic Procedures and Reagents* has been micro-filmed and flown to China for use in war areas. A new edition of this highly useful book is now being prepared and its scope will be extended by the addition of a number of referees who have been invited to prepare manuscripts.

You have already learned of the condensed version in Spanish of the volume on dairy products which is now under consideration. The *Report on the Control of Communicable Diseases*, to which we added our approval in 1940, is proving to be of great value in the emergency. *Recommended Practice for Design, Equipment and Operation of Swimming Pools and Other Bathing Places*, which this committee and the Governing Council approved at the last Annual Meeting, continues to fill a real need. Plans are now well along for a new edition of *Standard Methods for the Examination of Water and Sewage*.

There is now before your committee a revised report on *Recommended Methods of Procedure for the Examination of Shellfish and Shellfish Waters*. In conformity with the policy of this committee, ample opportunity has been afforded to interested persons and groups to criticise and comment on the report, and we have provided for an open discussion of the subject at the committee's meeting here.

We are pleased to report that, at the suggestion of this committee, the American Standards Association has revised its specifications for drinking fountains to conform substantially with those adopted by this Association. This step will eliminate much of the confusion that has existed in the field.

The Standard Methods Committee for Frozen Desserts and Ingredients of the Laboratory Section has circulated widely new proposed methods, and if these meet with general approval they will be incorporated in the next edition of *Standard Methods for the Examination of Dairy Products*.

The study of autopsied deaths being conducted by the Subcommittee on Autopsies is continuing but, owing to lack of further funds, will have to be completed when fifty thousand protocols have been abstracted by the end of January, 1943. A second contribution of a statistical nature will be presented at this meeting at a session of the Vital Statistics Section.

During 1942, the Subcommittee on the Hygiene of Housing, under Dr. C.-E. A. Winslow's able leadership, has

* Report of the Chairman of the Committee to the Governing Council, October 26, 1942.

concentrated on two lines of work intended to develop needed administrative tools for public health departments and other official bodies concerned with housing: (a) completion of the technic for appraisal of housing deficiencies in low-grade urban areas; (b) study of principles and practice in the field of housing regulation under the law.

The results of the application of the recommended appraisal technic as applied in three test areas, one each in New Haven, Waterbury, and Stamford, Conn., have been published in the weekly *Public Health Reports*.[1] The technical secretary of the subcommittee will present the finished study at this annual meeting of the Association.[2] A statement on the essential principles of housing regulations under the law will be made by Professor Winslow at the current Association meeting.[3]

Other committee publications and research during the year have included the following: (a) "New Light on the Relation of Housing to Health," (b) a study of the performance of inexpensive heating units in two experimental houses of the John B. Pierce Foundation, (c) "Essentials of Space Planning and Space Organization in Dwelling Units," (d) the pilot study of family living functions as affected by contemporary housing design, conducted with the Pierce Foundation.

Agencies responsible for the Government's war housing program have requested the subcommittee's advice or informal assistance in several matters during the year, including the revision of standards for war housing, the development of standards for dormitory types of temporary housing, and the formulation of housing standards for the billeting of war workers.

This completes the 13th year since the Committee on Research and Standards was established. While it has not occupied the broad field contemplated by some of those who outlined its charter, it has afforded a mechanism for bringing together at the Association level representatives of the several sections and of other organizations to consider technical matters of mutual interest. It has stimulated the formulation and constant revision of standards and of recommended procedures in the technical fields of public health, and served in a judicial capacity to advise the Governing Council concerning their endorsement by the Association. I believe that it should be continued.

KENNETH F. MAXCY, M.D.,
*Chairman*

REFERENCES

1. An Appraisal Technique for Urban Problem Areas as a Basis for Housing Policy of Local Governments. Report of the Subcommittee on Appraisal of Residential Areas, Committee on the Hygiene of Housing. A.P.H.A. *Pub. Health Rep.*, 57:285–296 (Feb., 27), 1942; also 57:485–501 (Apr. 3), 1942.
2. To be published in *A.J.P.H.*
3. *A.J.P.H.*, 32, 11:1263 (Nov.), 1942.

# Eligibility*

THE Committee on Eligibility is representative of each of the ten Sections of the Association. The members serve for a period of two years, five being elected annually by the Sections and confirmed by the Executive Board. The Executive Board also appoints an additional Fellow to serve as Chairman. The duties of this committee are to pass upon the eligibility of Fellows, members, and other constituents in accordance with the provisions of the By-Laws.

In view of the fact that membership in the Association carries no voting privileges and because there are no professional qualifications for membership, it becomes necessary for the Committee on Eligibility only to make sure that no persons are elected to membership who could be said to be a discredit to the Association. The consideration of eligibility for Life Membership, for Sustaining Membership, and for Honorary Fellowship is not arduous. The important task of the committee relates to testing the eligibility of Fellows and of screening the applications for election of Affiliated Societies.

Two years have elapsed since the By-Laws of the Association were changed by the Governing Council to make more specific and more rigid the requirements for Fellowship in this professional society. The Committee on Eligibility has taken seriously the request of the Governing Council to test each application strictly by the provisions of the By-Laws. This is no mean task, involving as it does the review of well over a hundred applications after they have passed through the Section Councils, and involving the exercise of considerable judicial discretion.

We note with interest the fact that raising the standards for Fellowship has not decreased the number of applications. Beginning with 1937, the annual number of Fellows elected was as follows: 60, 101, 77, 113, 123, and this year there are 139 applications. The average declinations by the Section Councils and the Committee on Eligibility has run about 8 per cent.

The number of membership applications last year totaled 1,034, of whom all were approved. This compares with the total of 836 for the previous twelve month period, an increase of nearly 25 per cent, contributing to the all-time high in Association membership.

At this meeting the Committee on Eligibility has reviewed the qualifications of 135 Fellowship applicants who had been previously approved for Fellowship by the various Section Councils and by the Executive Board, acting on applicants for unaffiliated Fellowship. Of this number, 133 have been approved by the committee, and their names appear on the list that has been furnished to each member of the Governing Council. It now becomes the function of the Governing Council to determine whether these individuals shall be admitted into the Fellowship of the American Public Health Association. The Committee on Eligibility after careful consideration recommends each of these names for your approval.

The committee has also approved six applications for Life Membership and the names of these applicants will also be found on the list before you. They are recommended for election to Life

* Report of the Chairman of the Committee to the Governing Council, October 28, 1942.

Membership by the Governing Council. Under our established policy this status is regarded in terms of its economic significance rather than in terms of an honorary significance.

The committee has carefully studied the routine for election of Honorary Fellows, and we are of the opinion that clarification is necessary in order to determine the proper place of the Sections in nominating individuals for this honor. The Committee on Eligibility recommends for consideration and approval of the Governing Council the following routine for the election of Honorary Fellows:

*For persons who are members or Fellows of the A.P.H.A.*

1. A resolution may arise from the Council of the Section with which a person is affiliated, or from the Executive Board, or upon the initiative of the Committee on Eligibility itself, suggesting the election of the individual as an Honorary Fellow. This resolution, in any case, to receive the consideration of the Committee on Eligibility.
2. The Committee on Eligibility considers the recommendation of the Section Council or of the Executive Board and passes on its recommendation to the Governing Council for final action.

For persons who are not members or Fellows of the A.P.H.A., a resolution may arise from any Section Council, from the Executive Board, from the Committee on Eligibility, or from the Governing Council itself, but it shall be established as a policy that such recommendations shall be referred to the Committee on Eligibility for consideration before the individual is elected.

The Committee on Eligibility respectfully recommends to the Governing Council the election of the following persons to Honorary Fellowship in the Association:

William M. Frazer, O.B.E., M.D.
E. R. A. Merewether, M.D.
Sir John Boyd Orr, F.R.S., LL.D.

The Committee on Eligibility also recommends to the Governing Council that those persons in attendance at this Annual Meeting as invited guests under the auspices of the Pan American Sanitary Bureau be recommended for Honorary Membership.

DON W. GUDAKUNST, M.D.,
*Chairman*

# American Museum of Hygiene*

ASSOCIATION COMMITTEE

EACH year since its appointment this committee has closed its report to this body with a recommendation that it be continued. This year, with great reluctance we omit that recommendation.

It will be recalled that we were appointed to promote the development of Museums of Health in America. Our progress has been previously reported. Museums of Health now exist in Cleveland and New York. Germinal interest in the establishment of museums in other cities has been submerged by the immediate necessities of war. Community leaders who in ordinary times could be counted on to advance the development of this newer instrument of health education have been called to other urgent tasks. Our committee members are similarly affected.

With two museums now established and the perennial concern of this Association in problems in health education, we can confidently assume that when the present world difficulties have been resolved, and a new postwar era offers new opportunities for new enterprises, the Governing Council and Executive Board will be eager to establish a new committee to carry on and to capitalize on the pioneer efforts of this committee.

In thus recommending that the Association temporarily halt one of its most progressive undertakings, the committee records its appreciation of the support and coöperation which the Association has given to it at every step in the way.

LOUIS I. DUBLIN, PH.D., *Chairman*
HOMER N. CALVER, *Secretary*
BERTRAND BROWN
JAMES A. DOULL, M.D.
KENDALL EMERSON, M.D.
BRUNO GEBHARD, M.D.
VICTOR G. HEISER, M.D.
SALLY LUCAS JEAN
GUY S. MILLBERRY, D.D.S.

* Eleventh Annual Report to the Governing Council
COMMITTEE ON AMERICAN MUSEUM OF HYGIENE
Organized 1931. Published reports: *Year Books* 1933–1934, 1934–1935, 1935–1936, 1936–1937, 1938–1939, 1939–1940, 1940–1941, 1941–1942.

# BOOKS AND REPORTS

## Annual Book Review

MAZŸCK P. RAVENEL, M.D.

*"Books are the legacies that genius leaves to mankind, to be delivered down from generation to generation, as presents to those that are yet unborn."*—ADDISON

THE war has left its impress, not only on the number of books issued during the past year, but on their character. While there has been a great deal of writing on military topics, a large part of it has not yet reached the book stage. There have been some revisions of books particularly useful in wartime which have been brought up to date and some of the newer methods described. There have also been a large number of pamphlets issued by official bodies, most of them designed for instruction of the civilian population and the many war agencies which have been created.

As heretofore, our chief guide has been our own JOURNAL, but we have regularly examined a number of other journals, especially *The Lancet* and *British Medical Journal*. The valuations of the books mentioned are those given by the reviewers in one or more journals, often in the words of the reviewers.

### BIOGRAPHY AND HISTORY

Under this heading there are a number of unusually interesting works many of which are timely. *Medical Work of the Knights Hospitallers of Saint John of Jerusalem*, by Edgar Erskine Hume, Johns Hopkins Press, is an excellent presentation of that remarkable body of men which has existed since the 11th century who made their way "across land and sea through the centuries protecting crusaders in medieval days or Spanish refugees today—any and all who needed help." Their hospitals were models for the world to follow; even in World War II one of their ambulance units was the first to come to the aid of the victims of "The Athenia." *Fatal Partners: War and Disease*, by Ralph H. Major, Doubleday, Doran, is particularly timely as pointing out some of the darkest lessons of war. The author is well known for his historical research. He admits that war provides for the doctors a vast laboratory in which to study the practical effects of the application of their knowledge, but holds that war in itself has contributed nothing to medicine. One lesson the book teaches is that our Army Medical Library remains the most comprehensive and efficient repository of knowledge useful in medicine in the whole world. *The Golden Jubilee of the Association of Military Surgeons of the United States—A History of Its First Half Century, 1891–1941*, by Edgar Erskine Hume, Association of Military Surgeons, is, of course, of primary importance to the members of the Association of Military Surgeons, but should be of interest to all, since it shows the important part played by this Association in the development of military medicine, and especially its work for preparedness during the half century of the Association's existence. Historically it is also interesting as giving photographic cuts of all the Presi-

dents and editors of the journal published by the Association, and also some facsimiles of documents and title pages of documents of historical interest. The appearance of *The Life of Florence Nightingale*, by Sir Edward Cook, Macmillan, is peculiarly timely in view of the impetus which the present war has given to tropical medicine and to military medicine. The history of Florence Nightingale is always valuable reading for all classes of people. She has been referred to as the "mother both of military and of tropical medicine." *Doctors Anonymous, The Story of Laboratory Medicine*, by William McKee German, Duell, Sloan and Pearce, is a frank plea for the recognition of the pathologist whose work has such a foundational relation to every branch of the practice of medicine and yet whose name so seldom appears. This book is highly recommended to the profession as well as to the laity. *The Man Who Lived for Tomorrow*, by Wade W. Oliver, Dutton, is intended for a biography of the late William Hallock Park, who perhaps was the most beloved bacteriologist America has produced. In spite of some shortcomings, it is, so far, the best biography of Park which has appeared and can be recommended as a tribute to that widely known man. *The American and His Food*, by Richard Osborn Cummings, University of Chicago Press, is a systematic account of food habits during the past century. It is pleasingly written and can be recommended to physicians, health workers, nutritionists, nurses, and intelligent readers of all classes. *The Value of Health to a City—Two Lectures Delivered in 1873 by Max Von Pettenkofer*, Translated by Henry E. Sigerist, Johns Hopkins Press, shows vision, marshalling of all forces, medical and scientific, to prevent disease. It represents the work of a pioneer medical statesman. *Four Treatises of Theophrastus von Hohenheim Called Paracelsus* — Translated from the original German, with introductory Essays by C. Lillian Temkin, George Rosen, Gregory Zilboorg, Henry E. Sigerist—Edited, with a preface by Henry E. Sigerist, Johns Hopkins Press, can be highly recommended, and the translation is good. A name which always appears in medicine is that of Paracelsus, who was something of a mystic but quite an observer, and his observations are credited with being the origin of industrial medicine and hygiene. *The Doctors Mayo*, by Helen Clapesattle, Introduction by Dr. Guy Stanton Ford, University of Minnesota Press, gives an interesting story of the three Mayos—father and two sons, who made a tremendous impress on medicine in America. That part of the book concerning the elder Dr. Mayo is extraordinarily successful. That concerning the sons is too highly colored and some reviewers have regretted that publication could not have been delayed "until all the pigments could be employed." *Doctor Bard of Hyde Park*, by John Brett Langstaff, Dutton, is a story of one of the famous physicians of Revolutionary time—a man who saved Washington's life on one occasion. He was the first American to write seriously of diphtheria, 1771. Not only was he a leading physician but also a striking figure in the early history of this country. *Life and Teaching of Sir William Macewen*, by A. K. Bowman, William Hodge, gives a history of the life, both physical and mental, of one of England's great surgeons, who was also a great teacher. In the last ten years of his life he gave distinguished war service and was also President of the British Medical Association. *Memorable Days in Medicine. A Calendar of Biology and Medicine*, by Paul F. Clark and Alice Schiedt Clark, University of Wisconsin Press, is useful as a book of reference for dates and biographies. *Source Book*

*of Medical History*, by Logan Clendening, Hoeber, is a compendium which spans the period from 1900 B.C. to 1895 A.D. It is a valuable book of reference, each chapter being preceded by a brief discussion of the period dealt with.

CHEMOTHERAPY AND SERUM THERAPY

The year has been noted for advances in chemotherapy, especially in the development of the "sulfa" drugs. The government has decreed sulfathiazole as a "must" treatment for gonorrhea in men in the services and there is continued use of some of the derivatives in the pneumonias. Most of this material is found in current journals and has not reached the book stage. However, we can report: *The Sulfonamide Compounds in the Treatment of Infections*, by Maurice A. Schnitker, Oxford University Press. This has been reprinted from Oxford Loose-Leaf Medicine. It gives the history, chemistry, and pharmacology of these compounds, also describes methods of administration, dosage, toxic effects, etc. It has brief reviews on other chemotherapeutic agents such as prontosil and its derivatives. It is not a treatise, but is sufficiently complete and accurate "to satisfy the harassed student, the busy practitioner, and the hurrying lecturer."

CHILD HYGIENE AND TRAINING

War conditions have made the care of children more than usually important if possible. There have been a large number of pamphlets and short articles on the various aspects of child care. Among the books which have appeared may be mentioned: *Delinquency Control*, by Lowell Juillard Carr, Harper. This is the outcome of a large experience and much study at the Michigan Child Guidance Institute. The book is a good guide and an inspiration to anyone seeking practical suggestions. From the public health concept it treats not only of control but of prevention. *Solving School Health Problems*, by Dorothy B. Nyswander, The Commonwealth Fund, is a "must" book for health officers, school superintendents, and directors of school health services. It is the outcome of four years of intensive study in New York City. *The Family in a World at War*, edited by Sidonie Matsner Gruenberg, Harper, deals with the various phases of family life in relation to the war emergency and national defense. The "Children's Charter in Wartime" has been prepared by a Commission on Children in Wartime of the U. S. Children's Bureau. The book can be thoroughly recommended for wide reading, especially at this time. The editor is to be congratulated in bringing together such useful material when the preservation of the family is of paramount concern. The origin of the book and the various organizations which have taken part in its production as well as the names of the special authors assure one of its value as well as its validity. *Developmental Diagnosis—Normal and Abnormal Child Development*, by Arnold Gesell and Catherine S. Amatruda, Hoeber, cannot fail to have a profound influence upon methodology in the study of young children and upon the supervision of their health and development based upon exact and exhaustive observations. It is of more than passing interest and will serve as a volume of reference for some time to come.

ENGINEERING

Engineering has always been one of the most useful branches of public health. We are especially dependent on the engineers in this time of war not only in protecting our men in the field, but also for conserving the health of the civilians at home. *Refuse Collection*

*Practice*, by the Committee on Refuse Collection and Disposal, American Public Works Association, is the first comprehensive treatise on this subject since 1921. It is complete and authoritative. *Water Purification for Plant Operators*, by G. D. Norcom and K. W. Brown, McGraw-Hill, is an instruction book for performance of routine duties by plant operators. It is a useful book in its field. *Public Works Engineers' Yearbook 1942*, American Public Works Association, contains more than 30 authoritative articles on subjects in which every engineer is interested. Both administrative and technical aspects of the problem are discussed. It can be recommended highly for administrators, libraries, public works engineers, and officials.

### HEALTH EDUCATION

It has been pointed out many times that if we could convince the public of the truth and daily importance of facts which are already well known and abundantly proved, thousands of lives and much illness could be saved, and this means that in the aggregate many thousands of man power days could be added to our production. We therefore welcome *Health Education of the Public*, by W. W. Bauer and Thomas G. Hull (2nd ed.), Saunders. New chapters have been added, including one on Philosophy of Health Education and one on Training and Qualifications. This second edition of a well known book will give valuable assistance and stimulus to all interested in public health.

### HOUSING

Housing has a special interest on account of the conditions in the country, the moving of great numbers of men with their families to centers of manufacture, ordnance, etc., with new settlements partaking of the nature of villages and towns springing up in widely separated areas. *Housing Yearbook—1942*, National Association of Housing Officials, Publication No. N 159, is a valuable compilation of articles on housing progress by various authorities. It is useful in considering the changes brought about in connection with housing agencies and activities by the federal authorities, the Navy, etc. Although omissions have been made on account of economy, the book is a standard for all interested in this subject.

### IMMUNITY

With the men of our armed forces being scattered to the four corners of the earth, immunization against various diseases has become a prominent feature of preparedness. It is rather surprising that we have only one book to report: *Immunization to Typhoid Fever*, by Colonel J. F. Siler and others, Johns Hopkins Press. This covers seven years' experimental studies made in the Army Medical School research laboratories and is an outstanding contribution to our knowledge of immunization against typhoid fever. There is nothing else like it in this country.

### INDUSTRIAL HYGIENE

This is another subject the importance of which has been greatly increased on account of war activities, with its multitude of new processes, new chemicals and combinations, all of which are closely related also to the housing problem and migration of workers. *Occupational Diseases*, by Rutherford T. Johnstone, Saunders, is useful to the general practitioner as well as specialists in the field of industrial medicine. Its publication is very opportune in this time of national emergency. *Eye Hazards in Industry*, by Louis Resnick, Columbia University Press, has been published for the National Society for the Prevention of Blindness and is timely in view of the

increase in industrial accidents during the last two years as reported by the Bureau of Labor Statistics and the National Safety Council, which say that 300,000 eye injuries occurred yearly in industrial fields, costing employers and the injured workmen more than a hundred million dollars. It is held that only 2 per cent of this enormous loss may be considered as unavoidable. The book can be highly recommended.

### MENTAL HEALTH

We have not seen any outstanding new book on mental health. However, the selection of men for all of the services has been more exacting and the training periods have in view the prevention, as far as possible, of some of the breakdowns always seen at such a time as this.

### NURSING

We might well have put the biography of Florence Nightingale under this heading. No one needs to be told of the importance of nursing and the part nurses play in a war. A very timely book is: *The Public Health Nurse in Action,* by Marguerite Wales, Macmillan. The author reaffirms her belief in the importance of the work of the public health nurse, calling her "a galvanizing agent." This is a most interesting and valuable presentation of the whole subject. *Nursing: An Art and a Science,* by Margaret A. Tracy (2nd ed.), Mosby, has been revised with the object of making it more useful as a textbook for student nurses. It can be recommended for use in schools of nursing and as a reference book for public health nurses. *Nursing: A Community Health Service,* by Amelia Howe Grant, Saunders, will serve the needs of many groups and individuals, and especially graduate nurses preparing for public health nursing and for students in the basic nursing education programs of study.

### NUTRITION

There is no need to stress the importance of good nutrition at this time. The slogan of the first World War was "Food will win the war." Now there seems to be no question that we are using food not only to win the war but to win and hold friends in practically every part of the world. The tremendous demands taxing our resources make the whole subject of great importance. The following books have been reviewed: *Nutritional Deficiencies,* by John B. Youmans, assisted by E. White Patton, Lippincott, was written primarily for practitioners. It should be read by all physicians and particularly teachers of medicine and nursing. The book can be recommended as an accurate and authoritative source of information. *We Need Vitamins,* by Walter H. Eddy and G. C. Hawley, Reinhold, is one of the best books on vitamins—accurate and written in nontechnical language so that the average lay person can understand it. So many things are being learned about nutrition and the vitamins that a book is scarcely printed before it becomes more or less out of date. However, this book can be recommended without reservation, especially for dietitians, though all doctors will find much of value in it. It should be a wholesome tonic against the reckless exploitation of vitamins which is going on in this country. *Modern Bread from the Viewpoint of Nutrition,* by Henry C. Sherman and Constance S. Pearson, Macmillan, is by one of the best known authorities and brings the matter up to date. Modern bread is very different from what "mother used to make." It is almost all "enriched" with an eye on mineral and vitamin content as well as the calories per pound. The book should have wide reading.

*Food and Drug Regulations*, by Stephen Wilson, American Council on Public Affairs, gives a complete story of food and drug legislation of the federal government. The book gives important facts, incidents, and excerpts of the bitter debates leading up to and through the passage of the Federal Food and Drug Acts of 1906 and 1938. A whole chapter is given to the history of food and drug legislation from the days of the Athenians and Romans to the passage of Pure Food and Drug Act of 1906. *Chemistry and Physiology of the Vitamins*, by H. R. Rosenberg, Interscience Publishing Company, is perhaps the most complete record of work done in the field of vitamins up to 1942. The subject matter is "critically and comprehensively appraised from chemical, physiological, nutritional, and industrial points of view. The book "should be heaven-sent to teachers of biochemistry, nutritionists, clinicians, and even to vitamin-plagued laymen." *The Biological Action of the Vitamins*, edited by E. A. Evans, Jr., University of Chicago Press, contains the fourteen papers presented at the symposium on The Biological Action of the Vitamins, held in connection with the 50th anniversary celebration of the University of Chicago in 1941. It is the best single source of information on these aspects of the vitamins now available. *Tables of Food Values*, by Alice V. Bradley, Manual Arts Press, is extremely useful to both scientists and lay persons concerned with the vitamin and other nutrient values of food.

### ORAL HYGIENE

Oral hygiene is another subject of great importance at all times but being emphasized in examination of men for the armed services. Napoleon said: "An army travels on its belly." With almost equal truth it travels on good teeth, as they play such an important part in nutrition. The output of books on the subject is again scant for this year, and we can mention only: *Professional Dentistry in American Society*, by Alfred J. Asgis, Clinical Press. The author considers the relation of the profession to society at large and emphasizes some of the responsibilities of one to the other. It is particularly recommended to health workers who are not dentists as stressing the integration of dental activities in a general public health program.

### PARASITOLOGY

It may become tiresome to our readers to repeat so much and perhaps we should have headed the general article by saying that all the topics considered are of more than usual interest at this time. It is true, however, that certain subjects have been brought to the fore by the fact we are waging a world war, and for the first time in our history we have three branches of the service—Army, Navy, and Marines — with the necessary nurses and lay personnel, living in the tropics under conditions which are new, not only to our forces but to practically every American, except here and there an explorer. From all accounts the average person has no conception of what insects generally, and parasites in particular, mean to soldiers in the jungles—the South Sea Islands, for example. *Textbook of Clinical Parasitology*, by David L. Belding, Appleton-Century, is a comprehensive and reliable reference for those dealing with animal parasites and the pathological conditions produced. It can be thoroughly recommended to students of tropical medicine, medical men, and laboratory workers.

### PUBLIC HEALTH

There have been few notable books on public health as such. However, some useful ones have appeared as well as some new editions and a number of

articles treating of the various subjects which pertain in one way or another to health. We can mention particularly: *Handbook of Communicable Diseases,* by Franklin H. Top and Collaborators, Mosby, which is a convenient compendium for health officers, interns, medical students, and nurses. *Encephalitis: A Clinical Study,* by Josephine B. Neal and Associate Authors, Grune and Strattan, surpasses the expectation of the most critical reader. It contains a wealth of information on each individual type of the large group of known encephalitides. There are more than a hundred selected case histories and 600 references arranged in sequence at the end of each subchapter. It is a "must" book for every library and public health worker, written in clear style, and set in beautiful type. The book fulfils a need that has long existed in medicine and public health. *Communicable Disease Control,* by Gaylord W. Anderson and Margaret G. Arnstein, Macmillan, is designed especially for health officers and public health nurses. It is written from the wide experience of the authors and is a useful summary of American practice, bringing together in a unique manner the functions of the health officer and public health nurse. It can be highly recommended to all workers in communicable disease control.

PUBLIC HEALTH AND THE WAR

This year we have used this heading, as a number of publications, mostly pamphlets or leaflets, have appeared under competent authority, devoted to war work. We can recommend: *Handbook for Civilian Defense,* by H. Mayer-Daxlanden, Civilian Advisory Service. Throughout a large part of the country the excitement over air raids seems to have passed; however, there is still reason for preparedness. In 1941 the Rose Bowl game and other gatherings were cancelled. In 1942 all the Bowl games took place, and we do not hear nearly so much of defense against air raids. The reviewer of this pamphlet recommends also, *Civil Air Defense,* by Lt. Col. A. M. Prentiss, of the U. S. Army; also more recent publications of the U. S. Office of Civilian Defense, the *Handbooks, Textbooks, Planning and Training Guides,* and *Bulletins,* British Library of Information, 30 Rockefeller Plaza, New York. *Preventive Medicine in Modern Practice,* edited under the auspices of the Committee on Public Health Relations of the New York Academy of Medicine, Hoeber, contains chapters written by a number of men, all experts in their respective fields. It is a discussion of the problems of preventive medicine which are "encountered by the physician in his daily practice, and in so far as possible, the presentation of solutions of these problems." It is authoritative. *War Gases,* by Morris B. Jacobs, Interscience Publishers, is most timely and especially useful to all concerned in civilian defense. With the possibility of the use of poison gases in the present war, defense against chemical war agents grows in importance. *Digest of State and Federal Laws Dealing with Prostitution and Other Sex Offenses,* compiled under the direction of Bascom Johnson by George Gould and Roy E. Dickerson, American Social Hygiene Association, shows the confusion which exists both in legislative bodies and among the public. It contains much practical knowledge of the means of prevention. This digest is of especial value to public health workers, legislators, and research workers. *Fundamentals of Anesthesia: An Outline,* by Subcommittee on Anesthesia of National Research Council, American Medical Association Press, discusses at some length in outline form the question of complications, as well as comfort and transport of the wounded. War gases are also named and dis-

cussed. *The Management of Fractures, Dislocations and Sprains,* by John Albert Key and H. Earle Conwell (3rd ed.), Mosby, is excellent and should be in the library of every physician and surgeon, especially during wartime. In the present edition extensive changes have been made and other chapters rewritten to bring the subject matter up to date. *War Injuries of the Chest,* edited by H. Morriston Davies and Robert Coope, E. and S. Livingstone, is a sound expression of thoracic practice at the present time. The chapter on anesthesia is able. *Surgery of Modern Warfare,* edited by Hamilton Bailey (2nd ed.), Volumes I and II, William Wood, represents British surgery at its best, depicting actual wartime surgical practice. The volumes are beautifully and lavishly illustrated. The illustrations alone are a liberal education in modern surgery. It would be hard to pick any one section which is better than the others, but "Shock and Its Treatment," "Skin Grafting in Wounds Involving Skin Loss," "Wounds of Arteries," and "Wounds of the Face and Jaws" are outstanding. Such practical and efficient directions on important phases of the treatment and management of wounds of the face, jaws and neck are seldom found. "This book depicts a new world in war medicine and surgery." *After-Treatment,* by H. J. Atkins, Blackwell, is especially good in its emphasis on human side of treatment and the common-sense approach to problems of convalescence. It is one of the best and most attractive on the subject. *The Blood Bank and Technique and Therapeutics of Transfusions,* by Robert A. Kilduffe and M. DeBakey, Mosby, covers a wide scope. It is a good history of the subject, is well produced, and informative. The appearance of this book is timely. *Medical Manual of Chemical Warfare* —Including also An Atlas of Gas Poisoning, Reprinted by Permission of the Controller of His Britannic Majesty's Stationers Office, Chemical Publishing Company, Inc., is an official release from the British office. Its value is enhanced by the inclusion of plates in colors. It is heartily recommended as an authoritative guide in the handling of a destructive agent of war with which we have so far not had to deal. *War Medicine.* A Symposium, edited by Winfield Scott Pugh, Philosophical Library, Inc. This book is a collection of outstanding articles on military medicine grouped in three sections: surgery, aviation and naval medicine, and general medicine. The articles for the most part are by English and American authors, either given entire or are abstracted. The material is concise and factual. There are articles on certain parasites and on problems in psychiatry peculiar to military personnel. The book deserves study by physicians engaged in military medicine and civilian physicians in private practice who expect to enter the service.

### TEXTBOOKS AND NEW EDITIONS

Textbooks and new editions are always looked for with interest. A revised edition is often better than the original, and should be, as most authors take advantage of the criticisms and suggestions by reviewers. The following may be mentioned: *Personal Hygiene Applied,* by Jesse Feiring Williams (7th ed.), Saunders, has been fundamentally revised and brought up to date, containing new sections on vitamins, specific diseases, etc. It is an excellent and standard book. *Standard Methods for the Examination of Dairy Products* (8th ed.), American Public Health Association, is the culmination of 36 years of study by specialists, and has been brought up to date. It is indispensable. *Stitt's Diagnosis, Prevention and Treatment of Tropical*

*Diseases*, by Richard P. Strong (6th ed.), Blakiston, is particularly welcome to all interested in this field of medicine which is of so much importance to our national defense in the present war. Its appearance at this time is most welcome and it should be in the possession of all medical libraries, teachers of the subject, and medical units in the armed forces. *Industrial Surgery*, by Willis W. Lasher (rev. 1st ed.), Hoeber, is an excellent book which covers the whole field of industrial surgery. It is especially to be recommended at this time when industry is geared for the tremendous war effort, and industrial surgery is a most vital subject. It is recommended therefore not only to those specializing in industrial medicine but to the general practitioner as well. *The Modern Treatment of Syphilis*, by Joseph Earle Moore (2nd ed.), Thomas, is a valuable compilation of the literature. Apart from the actual treatment, this book gives advice concerning the venereal disease control officer, "who should combine in himself public health experience and a wide clinical knowledge of syphilis." It is especially timely when the venereal disease question is playing such a large part in the making of our army. *Handbook of Hygiene*, by Joseph W. Bigger (2nd ed.), Williams and Wilkins, is presented in a clear-cut, concise manner and the material is well arranged. The first edition was well received, and the second maintains the standard and is brought up to date. *The Sanitary Inspector's Handbook*, by Henry H. Clay (5th ed.), H. K. Lewis & Co. A book that has reached its fifth edition in ten years must have something a little better than usual. The author is a Major in the R.A.M.C. This wartime edition includes a special reference to "conservancy" and to camp and rural sanitation, bringing the material up to date. While written from the English standpoint, every edition of the book has had good reception in this country. This one has an introduction by Sir Wilson Jameson, who points out that the sanitary inspector has become more highly specialized and technical within the British Empire than anywhere else in the world. *Community Hygiene*, by Smiley and Gould (3d ed.), Macmillan, is a standard book streamlined and brought abreast of the times, and is excellent.

### TUBERCULOSIS

Tuberculosis is always with us, and already there are signs of an increase in the incidence of the disease due to war conditions. *The Story of Clinical Pulmonary Tuberculosis*, by Lawrason Brown, Williams & Wilkins, is to be especially recommended. Published posthumously, it is by one of the masters in the study of tuberculosis, a victim of the disease himself. Containing much history, it is much more than a story of tuberculosis. Dr. Brown was almost as well known in connection with Saranac Lake as was Trudeau, the founder. Always a careful student, few men have ever been more widely beloved. The book will be useful to all physicians, whether specialists or not. *Tuberculosis in Industry*—Report of the Symposium Held at the Saranac Laboratory for the Study of Tuberculosis, Saranac Lake, N. Y., National Tuberculosis Association, is a timely book in view of the pressure under which industries are now operating. Reduction in deaths in the industries has paralleled that in the general population. It is fifth in importance of all diseases and accounts for 6.5 per cent of deaths among workers. Under the etiology of tuberculosis silicosis was naturally considered. Only those dusts high in free $SiO_2$ are known to alter appreciably the susceptibility to tuberculosis. Education was stressed and early case discovery is regarded as the key to prevention.

MISCELLANEOUS

There are always a number of books which are hard to put in one little compartment so we have taken the best of them and put them under the meaningless title of "Miscellaneous." The following can be recommended: ***Strange Malady,*** by Warren T. Vaughan, Doubleday, Doran. This is a history as well as a discussion of allergy with only a brief section devoted to treatment. Certain reviewers believe that the book is misleading in that it states sensitization to foods is the commonest form of human allergy. Experts in allergy and in internal medicine will be inclined to criticise this statement. With this exception the book is up-to-date and correct. It is well written and the illustrations, while amusing, portray accurately many of the complicated problems of immunity. ***Administrative Medicine,*** edited by Haven Emerson, Nelson, combines treatment of the field of public health and medical care in one volume, and under a new name. Fifty-six authors have taken part in the making of this book. The section on public health will prove particularly attractive for readers of this JOURNAL, though there is something for all interested in public health from any standpoint. It is a real contribution to the scant literature of the subject. ***The Anaerobic Bacteria and Their Activities in Nature and Disease*** (A Subject Bibliography), by L. S. McClung and Elizabeth McCoy, University of California Press, is Supplement I Literature for 1938 and 1939. It is a book necessary for all libraries and should be in all medical schools. ***About Ourselves,*** by James G. Needham, Cattell Press, is an unusual book, written by a biologist. It is pessimistic inasmuch as he says that man is so much of an animal that war appears to be inevitable. It is a most useful book for study by all educated people who wish to know more about that curious complex we call "homo sapiens." ***Speaking of Man,*** by Michael F. Guyer, Harper. At first sight one might wonder why a book by a biologist should be especially useful at a time like this, but both the author of *About Ourselves* and this book refer to war and describe man as belonging to the fighting animals. Guyer says: "And since war is outstandingly a biological phenomenon the biologist's views concerning struggle in nature, about competing social systems, and above all, regarding that combative social animal, man, may be worth considering by thoughtful folk who seek a peaceful world. As is true of practically all animals where the male is the larger, stronger, better armed and more highly ornamented, man is by nature a fighter." ***Behind the Mask of Medicine,*** by Miles Atkinson, Scribner, an unusually good study of the many problems which confront the physician in his practice, considering them from the historical, religious, sociological, and practical points of view, which should be in the library of every physician. It would be well if the public could be induced to read it widely. The author "inculcates the highest standards of conduct under every circumstance which may confront the doctor either as a physician or man." ***The Microbe's Challenge,*** by Frederick Eberson, Jacques Cattell Press, is an unusually well done popular story of bacteriology and many of its accomplishments. It is one of the best summaries of the subject matter which has ever been written. ***Rabies,*** by Leslie T. Webster, Macmillan, intended for students, research men, physicians, and veterinarians, though especially designed for those having some knowledge of the disease, who should in turn, pass it on to the laity to dispel the superstitions and myths which are so widely spread. Apart from its scientific character and the result of the author's research, the

book contains in addition much good sense and a lot of practical knowledge.

Any attempt to select books for special attention will be immediately subject to attack. Omissions of certain titles will be regarded as serious by some; others will feel that one or another book is distinctly not worthy of mention. Criticism of over-emphasis on one category and neglect as to another may be expected. While the selections in this article are the writer's, the comments in the majority of instances are the reviewers'. The combination, we trust, will not prove too unhappy.

**Annual Report of the Commonwealth Fund for the Year Ending September 30, 1942.** 62 pp.

This 24th annual report of the Commonwealth Fund records a moving story of the efforts made "To do something for the welfare of mankind" in conformity with the declared purpose of the Fund. Disbursements during the year exceeded $1,937,000 and again the greater part of the available income has gone through various channels into the promotion and conservation of health. Besides making substantial contributions to several war funds, continuing the medical research for which the Fund has long been known, and promoting interest in medical education and in mental health, the Fund once again has made direct investments in public health and health studies. A unique feature lies in the field units of specially trained staff made possible in Tennessee, Mississippi, and Oklahoma to afford a mobile resource which must be of immense tactical value to state health officers in these days.

The Fund has continued grants to rural hospitals and to international fellowships, fifteen of which went to Latin American Fellows last year. Among the books published by the Fund are two of especial interest in public health, *The Modern Attack on Tuberculosis,* by Chadwick and Pope, and *Solving School Health Problems,* by Nyswander. Many a health officer who reads this report will wish that he were as free to direct his efforts into fruitful channels with long-range promise as the officers of the Fund have been. The public health profession will agree that the hope of the future lies in the kind of strategy which underlies the work described in this report.

REGINALD M. ATWATER

**Communicable Diseases**—*By Nina D. Gage and John Fitch Landon (3rd ed.). Philadelphia: Davis,* 1942. 458 pp. Price, $3.50.

The third edition of *Communicable Diseases* by Gage and Landon carries the same high standards as the first two. There are added sections on tetanus, the differential diagnosis of communicable diseases characterized by exanthematous eruptions, and on the home care of the communicable disease patient. To those who are not familiar with this book it should be stated that there are many appropriate illustrations which in the main are very well done. A few of the color plates could be improved by the natural color processes now available.

The format of the book is excellent. An outline of the subject matter of each section is followed by a discussion of the medical consideration, the methods of control, and the nursing care. This orderly arrangement is helpful when using the book for reference.

The chapter on the sulfonamides has been revised and gives practical information as to the type of the drug to

be used and dosage for the various diseases. Minor misstatements regarding the availability of sulfathiazole in the section on gonorrhea, and regarding the specificity of sulfanilamide in the treatment of gonorrhea in the section on chemotherapy are mentioned by the reviewer but are not of great importance, since the book has been prepared for the primary purpose of instruction in the nursing care of communicable disease.

The section dealing with the Commoner Communicable Diseases, such as diphtheria, scarlet fever, measles, and whooping cough, is well written and gives a particularly clear picture of the clinical as well as nursing aspects of the diseases described.

WILTON L. HALVERSON

**Community Workshops for Teachers in the Michigan Community Health Project**—*By Henry J. Otto, et al. Ann Arbor: University of Michigan,* 1942. 303 pp. Price, $2.00.

This book describes a pioneering experiment in organizing and conducting four workshops for in-service training of teachers during the summer of 1941 by the University of Chicago and the University of Michigan, aided by the Kellogg Foundation. The workshops dealt respectively with the following problems: health education; science education; democratic citizenship and the health of children and problems in social science, library science and the language arts.

A unique feature of the plan is the "grass roots" approach which was used. The workshops were conducted in four local communities within a seven county area. Teachers helped determine the problems for attention and had an active part in daily program planning. Emphasis was placed on meeting local needs through more effective use of local resources. Thus the local health personnel were important resource people in the health education workshop and the local health problems important aspects for study.

Among the activities described are work in the laboratory school, field trips, individualized study, group discussions, and coöperative projects with community groups. Emphasis was placed on the practical application of theoretical concepts in community living. The book is well illustrated.

The growing pains associated with this newer approach are revealed with frank objectivity. The evaluation of the workshops by the teachers themselves shows a gratifying satisfaction with the informal program.

Adaptations of the methods used may be one practical answer to in-service training under present wartime conditions. Local departments of health and education and teacher training institutions should find help in this book on ways in which they can stimulate and assist in similar training programs so that more teachers are made ready to take greater responsibility for school and community health work.

RUTH E. GROUT

**Extra-mural Teaching of Preventive Medicine and Public Health**—*By Alfred Korach, M.D., with a preface by T. J. LeBlanc, M.D. Medical Bulletin of the University of Cincinnati,* Vol. IX, 1942. 143 pp.

Public health workers, as well as medical educators, have become increasingly concerned with the need for greater emphasis in the medical school curriculum upon the prevention of illness and upon the influence of social, economic and other environmental factors in the occurrence of disease. It has also been recognized that the undergraduate medical student should be made familiar with the community health resources which assist and supplement the efforts of the private prac-

titioner in the treatment and prevention of disease. It is with these phases of medical education that this volume deals. Particular attention is given to field instruction which the authors consider as the *Extra-Mural Teaching of Preventive Medicine and Public Health.*

No claim is made that the program of teaching in the Department of Preventive Medicine of the University of Cincinnati College of Medicine is the best or only way to approach the problem. In fact, the extensive outline and analysis of the required and elective course of instruction for sophomore medical students followed since 1939 is offered as a guide and a source of reference for others faced with the task of planning curricula with similar aims. Dr. LeBlanc and Dr. Korach are to be commended for their presentation. Ample space is devoted to student comments upon this experience and a valuable bibliography of authoritative references is appended to the text.

T. D. DUBLIN

**Hospital Discharge Study—Hospitals and Hospital Patients in New York City** *(Vol. I)—By Neva R. Deardorff and Marta Fraenkel. New York: Welfare Council of New York City,* 1942. 209 pp. Price, $1.00.

Since Dr. Bolduan first pointed out the importance of collecting hospital morbidity statistics in 1913, a great deal has been written about the problem but few actual reports on the collection of material have appeared. This volume, the first of three, is of importance since it represents the first contribution to this field which includes almost complete data on hospitalization in an urban center for an entire year.

The Welfare Council of New York City, with the assistance of state and city work relief authorities and the WPA, initiated the survey on January 1, 1934. Of a total of 134 hospitals under voluntary and municipal control, offering general and special service of any kind, and institutions for the chronically ill in New York City (excluding proprietary, federal and state hospitals) 113 hospitals with 88 per cent of the total number of beds participated in the study; 576,623 discharges representing 546,235 persons occurred in these hospitals in 1933.

This first volume contains a summary and description of the general characteristics of these patients including demographic data, and discussions of migration for hospitalization, diagnosis and mortality, financial status, length of stay and readmissions. The text is supplemented with 58 tables and 12 appendices. In addition, there is a carefully selected bibliography on morbidity and methods of measuring morbidity.

The detailed study of diagnosis and morbidity is to be published in the next two volumes. Information of this type, together with material now available through Hospital Service Plans, is needed for adequate and proper planning of future hospitalization.

EDWIN L. CROSBY

**The Lives and Loves of Huber the Tuber**—*By Harry A. Wilmer, M.D. New York: The National Tuberculosis Association,* 1942. 83 pp. Price, $1.00.

A riotously gay tale of a tuberculous bacillus and his friends. The entire gang are so personalized as to become real creatures battling against Monosights.

In a most realistic fashion, Huber accompanied by his troops, like Alice falling down the hole to Wonderland, slipped into the bronchial tube to invade the lungs of a human—then the war begins—the gang launching their treacherous work against Monosights. Each stage of the struggle occurring in the lung is graphically described in words as well as in unique illustrations. Few there are so uninformed as to miss

the lesson conveyed throughout the drama.

Lungland becomes a friendly territory attacked by enemies without. All of these characters are identified with whimsical titles suggestive of the day, Rusty the Bloodyvitch, Huey the Long Tuber, Gobbles, Gorring, Takiotuber. Chief of the Monosights is Corpuscle Lipsky, whose entire army become the Signal Corps, Military Police, Mechanized Forces, Infantry, Engineer Corps, etc.

A brief description in a serious vein is offered with each act and also in a summary presented as a preface. The only weakness in this delightful contribution is the author's failure even to hint at the time element involved. It all seems to happen in a brief period, a day or even an hour. Perhaps that was the author's intention as the period of invalidism required for the success of Monosights requires patience and persistence to endure the enforced rest necessary in combating Huber the Tuber.

Dr. J. Arthur Myers in the introduction to the book gives a glimpse of the remarkable character and unconquerable spirit of the youthful author who wrote and illustrated the book during months of leisure due to a tuberculous bacillus.

"Dr. Wilmer did not become discouraged because of his fate but rather he saw an opportunity to enter into the great campaign against tuberculosis, which otherwise probably would not have presented itself. The tubercle bacillus had suddenly caused a termination of his hospital work; it had seriously interrupted his plans, but almost as though nothing had happened, or as though it had been planned for years, he took up another phase of health work and has pursued it diligently."

This slim volume of 80 pages, with the author's distinctive drawings, is well printed on good paper. The book can be heartily recommended for old and young. Here's hoping it will become not only a best seller but may be used as the basis for a motion picture.

SALLY LUCAS JEAN

**Nutrition and Diet Therapy**—*By Fairfax T. Proudfit (8th ed.). New York: Macmillan,* 1942. 1,057 pp. Price, $3.25.

This edition, published in June, 1942, represents the first revision of this popular book since September, 1938. In a science such as nutrition where scientific research is adding new material at such a rapid rate, it is obvious that a book on this subject needs frequent revision. It is also the obligation of the author to keep the volume of material under reasonable limitation in spite of the new additions being made.

The organization of this edition is practically the same as that of the seventh except that an additional section has been added to include the nutrition and feeding in pregnancy and lactation as well as the feeding of children of different ages. One-fifth of the book is given over to the fundamentals of nutrition, and a little less than 100 pages each to feeding in obstetrics, lactation and children of different ages and to laboratory lessons. The last 600 pages are occupied with Diet Therapy and Recipes. The author well points out that in the hospital the doctor gives the diet orders and the student carries them out. Patients as a rule do not understand the common rules governing nutrition and, therefore, in order to gain their full coöperation it is necessary to explain things to them. The student, consequently, needs training in order to perform these tasks efficiently.

It is to be regretted that the author did not see fit to devote some of the space given to cookery, and other subjects more related to the field of home economics, to such subjects as nutri-

tional field surveys, food rationing, reinforced bread, meat substitutes, and other nutritional matters growing out of federal food supervision as a defense effort.

Nevertheless, the book has proved its value in previous editions and the present one is well up to standard. The author is well known and her presentation of material is extremely practical.

IRA A. MANVILLE

**Standard Nomenclature of Disease and Standard Nomenclature of Operations**—*By Edwin P. Jordon, Editor. Chicago: American Medical Association,* 1942. 1,022 pp. Price, $4.00.

This volume consists of the third edition of the *Standard Nomenclature of Disease* and the first edition of the *Standard Nomenclature of Operations.*

Changes from previous editions of the text on disease nomenclature include: (1) about 3,500 additions, deletions and corrections to individual diagnostic items; (2) the printing in bold face type of some of the more frequently used terms; (3) exclusion of numbers corresponding to those in the *International List of Causes of Death;* (4) the addition of a table of eponymic diseases, and (5) the omission of *Classified* from the original title. The section on operations is an attempt to set up a standard terminology similar in its arrangement and usefulness to the one on diseases.

Despite the wide acceptance of the Standard Nomenclature by many well known physicians and prominent hospital groups and its sponsorship by the American Medical Association, many students of nosology and the problems of medical nomenclature question the advisability of its widespread use either in the teaching of standard diagnostic terms or in quantitative medicine as a classification of disease entities. Some of the arguments offered are:

(a) No standardization of diagnostic entities can be agreed on completely without first defining each term and using it only when it both denotes and connotes precisely a meaning understood by all competent physicians. This would be hard enough for the well defined clinical entities, but when attempted for the poorly defined ones, it becomes almost impossible. Standardization also precludes the use of synonyms and eponyms.

(b) The present anatomic and etiological classification is eminently satisfactory for certain diseases, but often becomes quite complicated, particularly in the specialty fields.

(c) The numerical coding system is too complicated to be used satisfactorily either as a diagnostic cross index or as a means for tabulating diseases for statistical purposes. In addition, the time and study necessary to employ the system intelligently is often more than the casual user can afford.

EDWIN L. CROSBY

**The Standard of Living in 1860**—*By Edgar W. Martin. Chicago: Chicago University Press,* 1942. 450 pp. Price, $4.50.

It is the secondary title "American Consumption Levels on the Eve of the Civil War" that best reveals the purpose and content of this interesting source book. Apart from the introductory and concluding chapters, the book consists of eleven topical collections or catalogues of well documented facts which may prove useful to students of economic history, but only inferentially indicate standards of living in the intellectual, ethical, or professional spheres.

There are some 49 tables of costs, consumption, prices, family budgets, wages, population, and similar matters. Documentary footnotes are abundant.

In only one chapter (VIII) of 78 pages is there any information directly

related to health either personal or public, and most of this is dedicated to the quantity and quality of the practice of curative medicine.

No one at all familiar with the scene of medicine or public health will find any facts or ideas in this chapter at all novel in substance or form.

The book will satisfy a curiosity of those who are entertained by turning the pages of a relatively recent past, when there was little notable or inspiring in the American practices of earning and spending and saving and wasting.

This book will probably be found useful as a storehouse of facts. Their interpretation and bearing upon levels of living is not included to a noticeable degree in the text.

The conclusion would seem to have been predictable that the "American Standard of Living" included more goods producible in a mass manner than was the case among Europeans.

The index is well done.

HAVEN EMERSON

**Virus Diseases**—*By Members of the Rockefeller Institute for Medical Research. Ithaca, N. Y.: Cornell University Press,* 1943. 170 pp. Price, $2.00.

This volume is only 170 pp. long and covers certain phases of the virus field. The following six articles constitute the entire work: Virus Diseases with Particular Reference to Vaccinia, Chemical Structure and the Mutation of Viruses, New Hosts as a Key to Progress in Plant Virus Disease Research, Swine Influenza, Human Influenza, and Viruses and Tumors.

Obviously a volume of this size cannot hope to cover the entire field of virus diseases, nor are any pretensions made to do so. The material which is presented is concise and clear-cut. Although dealing with only a small portion of the complicated virus field, the data have been well digested and to some extent may prove more valuable to workers interested in virology than some of the larger more comprehensive volumes in the same field, which are entirely lacking in critical analyses and offer unselected masses of facts.

*Virus Diseases* is particularly useful, because the work has been covered by competent specialists in each subject. Working hypotheses have been presented for such fundamental questions as virus immunity and immunization, adaptation of viruses to new hosts, and the course which the infection may take. On several occasions both sides of controversial subjects are discussed.

Virologists and newcomers to the field will find *Virus Diseases* helpful for one reason or another. Although it must be used in conjunction with some of the larger texts in the field it is a necessary and valuable adjunct.

MURRAY SANDERS

**War Medicine—A Symposium**—*Edited by Winfield Scott Pugh, M.D. New York: Philosophical Library, Inc.* (15 East 40th St.), 1942. 565 pp. Price, $7.50.

*War Medicine, A Symposium* is a collection of outstanding articles on military medicine, orderly arranged and on the whole fairly well illustrated. The articles are grouped under three sections of surgery, aviation and naval medicine, and general medicine. For the most part various articles by English and American authors are quoted entirely or abstracted and the material is concise and factual.

Surgery reviews such subject matter as war wounds and wound healing, burns, anaerobic infections, wounds of the chest, gunshot wounds and their treatment, blast and concussion injuries, shock, blood substitutes and fractures.

Aviation medicine presents certain medical principles peculiar to aviation

such as hypotension, problems in cardiology, fatigue, compression injuries and the medical aspects of deep sea diving.

General medicine discusses gas casualties, nutrition, allergy, dysentery, certain parasites and certain problems in psychiatry peculiar to military personnel.

Despite the unusual prominence of the contributors to this book the reader gets a series of opinions and recommendations by experts, some of which appear rather extreme to one not experienced in the particular field, and does not get a good descriptive presentation of a single subject followed by specific directions for therapy. Except for this one criticism, *War Medicine* is a book which deserves study by physicians engaged in military medicine and civilian physicians in private practice who expect to enter the service.

L. R. CHANDLER

**Publicity—How to Plan, Produce and Place It**—*By Herbert M. Baus. New York: Harper,* 1942. 252 pp. Price, $3.00.

Until recently publicity was synonymous with ballyhoo, "hot air," and the tricky showmanship of P. T. Barnum. Today, however, publicity has divorced itself from its early connotations and has emerged to fill an increasingly important rôle in world affairs. It is still, of course, put to devious uses. When concocted by thwarted dictators, it can help to plunge nations into war; when fashioned and directed by those with humanitarian instincts, it can play a major rôle in molding a new era of peace and progress. Only through an understanding of this subject can we make sure that publicity fulfils its true purpose: to inform the public truthfully, to stir people to think, to encourage the free exchange of ideas basic in a democracy.

It is fortunate, therefore, to have an authoritative book on publicity appear at this time. Mr. Baus possesses an encyclopedic knowledge of the subject and its ramifications. In a friendly, entertaining, and informative manner the author discusses all types of publicity—its functions, its technics, its operations, and some of the tricks of the craft. The text is split in three main sections: (1) planning or blueprinting, (2) production or manufacture, (3) placement or distribution. The reader is guided through the "beehive complexity" of the daily newspaper office, the news and photo syndicates, and other publicity producing centers. The policies, the do's and don't's and the idiosyncrasies of the editorial craft are also exposed.

The scope of the book is not limited to printed media, but the radio, the motion picture, letters, exhibits, word-of-mouth publicity (telephone conversations and public speeches), parades and pageants, are also included.

The book does not treat of health publicity as such, although the formulas unfolded in its pages can be adapted to the work of the health educator. Mr. Baus briefly discusses sociological publicity—under which health agency publicity might well be included—and he states that publicity emanating from welfare organizations should have quick entree to all publicity media because of its unselfish and non-commercial nature. The author frankly states that the one drawback preventing greater coverage or acceptance of sociological publicity is its dry and uninteresting nature. Mr. Baus warns against "ballyhooing" publicity of this type and suggests that sincerity be the keynote of public agency releases.

As to the qualifications which a publicist should possess, the author states that there are no cut and dried requirements, no specific professional qualifications. The publicist in any field must be a writer-artist-politician-businessman combined. He must know a little about

everything. Perhaps the prime requisite for a publicist is imagination: he must be able to ferret out newsworthy items in material that others would consider only a pile of dull data.

This book is unreservedly recommended—especially to health educators. The writing is lively, the contents are copious, the point of view is sane. Even if one is wholly uninterested in the mechanics of publicity, this book is entertaining as pure reading matter. It should set the feet of any aspirant with a grain of publicity sense along the right path. JOHN LENTZ

**Terminology and Definitions of Speech Defects**—*By Mardel Ogilvie. New York: Bureau of Publications, Teachers College,* 1942. 312 pp. Price, $3.50.

This is an attempt to clarify the matter of terminology of speech defects, but the volume is so overorganized that it is next to impossible to find anything in it. LETITIA RAUBICHECK

**Minerals in Nutrition**—*By Zolton T. Wirtschafter, M.D. New York: Reinhold Publishing Corporation,* 1942. 175 pp. Price, $1.75.

The author discusses the physiological significance of the essential inorganic elements in non-technical language and without consideration of the other essential nutrients. There are inevitable shortcomings in a book which attempts to present the metabolic functions of a single class of nutrients without consideration of the many organic nutrients. The lay reader cannot be accurately informed and gain a comprehension of either physiology or nutrition from this discussion of a single group of elements or compounds.

There are many inaccurate statements. On page 32 it is stated: "Sodium chloride has two vital functions: (1) It helps to maintain the acid-base balance of the body; that is, it automatically keeps us 'on the alkaline side.'" Carbonate, bicarbonate, and phosphate ions are not mentioned as buffer substances. On page 131 it is stated: "By reducing the manganese content of the diet for rats egg formation fails to occur and reproduction is therefore impossible." On page 118 it is stated: "In cases of goiter, about three times the normal amount of iodine is present in the urine."

The book suffers from an attempt at over-simplification of a complex subject, as well as from careless and inaccurate statements.

E. V. MCCOLLUM

**Julius Rosenwald Fund**—*Review for the Two-Year Period 1940–1942—By Edwin R. Embree, President of The Fund. Chicago, Ill.,* 1942. 39 pp.

This is a stimulating review of the work of The Fund during the past 15 years, in which Negro health occupied a substantial part. This part of the program officially ended in 1942 after the expenditure of a total of $1,478,000. An excellent condensed report of trends in Negro health is included. The chapter on Color and Democracy shows the underlying significance of the effort to improve medical care, public health, and education for this part of our population. REGINALD M. ATWATER

**When Doctors Are Rationed**—*By Dwight Anderson and Margaret Baylous. New York: Coward-McCann,* 1942. 255 pp. Price, $2.00.

The intent of this volume is excellent, namely, to give the general public an insight into the problem of providing medical care and the procedures established to provide adequate medical service for both the military forces and the civilian population. The book succeeds in doing this, however, only moderately well and with uneven balance.

When it describes the procurement

and assignment of physicians from the purely mechanical standpoint, it does so in simple and informative style. When other more difficult and perhaps more subtle problems of medical care are reviewed, the attempt at popularizing leads to a simplification of statement which becomes almost annoying and which results, too often, in the avoidance of real issues.

The authors of any volume designed to popularize somewhat complicated features of nation-wide controversial issues run the risk of inaccuracy in undue popularization. This is particularly true in the chapter dealing with public health, where the comparisons of accomplishment in this country with that of European countries is unfortunately overenthusiastic in favor of our own. After all, Europe and particularly England and Germany have had a long and sound accomplishment in public health. It is different from ours, but need not be too severely disparaged.

The chapter dealing with "Doctors and Boom Towns" shows some confusion between the necessity for providing physicians for industry and that of providing physicians for the areas surrounding industries. In the first instance, the doctors are needed within industry for industrial hygiene purposes, in the second instance, they are required for the general medical care of the surrounding population in civilian life. The two purposes are largely confused in this chapter, with the latter aspect given little or no discussion.

This confusion would not be nearly so serious if it did not result in avoiding entirely the important problem of civilian medical care in a number of boom areas, such as Mobile, Hampton Roads, Valparaiso, San Diego, etc.

In similar fashion the chapter on "Women Doctors in Wartime" hardly does justice to this problem. The 4½ pages devoted to this subject really leads nowhere with respect to more effective use of women doctors in or outside of the military services.

Much useful information known to the medical profession, but unfamiliar to the layman, is set forth most of the time with clarity and realism. Perhaps the outstanding deficiency of the volume is that it does not recognize any of the problems in medical care which still confront the general public, namely, of distribution of physicians, of the economics of medical care, and of the pressing controversies as to group practice and hospitalization. The discerning public will probably note and assay these omissions in the volume when it is read. ABEL WOLMAN

**Nutrition and the War** — *By Geoffrey Bourne, D.Sc. (2nd ed.) Cambridge: University Press. New York: Macmillan,* 1942. 148 pp. Price, $1.50.

This short, concise text is designed solely for the layman, and intended as an aid to the housewife in the selection of alternative foods in the event that the usual foods were unobtainable. In easily understandable language, it considers the energy value of foods, treats of the function of proteins, fats, and carbohydrates, lists the common or well known vitamins, and considers each one separately as to its significance.

Under the chapter headed "Nutrition and War Time," the question of protective and non-protective foods is considered as well as vitamin overdosage, food supplies, food and health, in addition to a short treatise on the German and Russian food situation. The figures quoted for overdosage of vitamins A and D are somewhat out of line, and much more conservative than commonly accepted. Finally, the author in this chapter postulates the problem of the nutrition of the future. The last chapter in the text, consisting of nearly one-half the entire volume,

deals with the nature and composition of various foodstuffs, listing caloric value, protein, fat, carbohydrate, mineral, and vitamin content in terms of very good, good, fair, very poor to negligible.

HENRY T. SCOTT

**Group Differences in Urban Fertility**—*By Clyde V. Kiser. Baltimore: Williams & Wilkins,* 1942. 284 pp. Price, $2.50.

*Group Differences in Urban Fertility* is an analysis of the fertility data obtained in the National Health Survey in 1935–1936. The character and size of the sample population studied make this a reliable source of information, even though the data are not derived from the whole of the United States. Until the detailed 1940 census tabulations are available, Mr. Kiser's study constitutes the most extensive and detailed source of information on recent fertility differentials.

The basic data are in the form of annual birth rates and so are not directly comparable with some earlier studies dealing with the total number of children ever born. Certain conclusions concerning trends in the differentials can be drawn from the material however. In general, the familiar pattern of high birth rates in families of low socio-economic status and increasingly lower birth rates as socio-economic status improved, is repeated in the National Health Survey data. All differentials, however, appeared to be narrowing perceptibly, and in some instances there was a definite reversal of the pattern.

One of the most valuable chapters in the book deals with the cross-classification of the attributes considered. For example, the birthrates of native white wives, classified according to occupational status of the husband, were analyzed for the effects of income and education within each occupational group. This analysis demonstrates clearly the biases in each single type of classification. The chapter on pregnancy wastage, though based on fragmentary data, should be of special interest to public health workers.

The book will be valuable as a reference text embodying detailed analysis of the most recent broad population data for selected cities of the United States.

REGINE K. STIX

**Proceedings of Sixty-Ninth National Conference of Social Work, New Orleans, May, 1942**—*New York: Columbia University Press,* 1942. 670 pp. Price, $5.00.

Wartime problems held the center of the stage at the 1942 National Conference of Social Work.

Reviewing the Conference proceedings, recently off the press, we see this unifying theme tying together much more effectively than usual, this great conference, so likely to resemble a six ring circus in its wide range of interests and activities.

Malcolm MacDonald, High Commissioner from the United Kingdom of Canada, perhaps came as near sounding the keynote of the conference as any of the notables on the program. Said MacDonald, "One of the best ways of preserving the morale of the civilian population is by keeping at full blast all those social services which can contribute to a fitness of body and a calmness of mind under a terrific ordeal."

An excellent group of papers is found in this volume: President Shelby Harrison's Social Work on Three Fronts; Vera Micheles Dean on After Victory; a series of thoughtful discussions of the upsurging Negro problem in the South; others on the impact of war on social work needs and on children; developments in the fields of health, employment, and Social Security. Together they constitute a volume that is timely as well as a valuable permanent record.

BLEECKER MARQUETTE

# A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**War's Toll**—Though the death rate in this representative sample was lower for 1942 than for 1941, most of the improvement occurred in the childhood age groups and over age 55. Among white males ages 20 to 24 the excess was almost 34 per cent. Nearly half these deaths were in the military personnel. This is a solemn reminder of what we may expect of the current year.

ANON. Mortality Record for 1942. Stat. Bull. (Met. Life Ins. Co.), 24, 1:1 (Jan.), 1943.

**First Aider—Stop, Look, Listen!**—External heat to treat shock is a time-honored method. Anyone who has read even the most elementary first aid manual knows enough to run for blankets and not-too-hot water bottles. Cautiously, it is proposed that heat be *not* applied in shock when only the skin is cold but rectal temperature is normal or above. The chief reason for including a reference to the subject still in the research stage in this column for practising health officials is to remind us that humility is above price, and that even in matters of first aid the last word is yet to be said.

ANON. Cooling in Shock (An Editorial). J.A.M.A. 121, 6:432 (Feb. 6), 1943.

***Brucella suis***—Here is still another for the record: an epidemic of brucellosis numbered 77 victims among the users of an unpasteurized milk supply. Raw milk addicts may be reminded that the average duration of fever was 6 to 8 weeks, and that undulant fever is no fun.

BORTS, J. H., *et al.* A Milk-Borne Epidemic of Brucellosis. J.A.M.A. 121, 5:319 (Jan. 30), 1943.

**What the Division of Industrial Hygiene Does**—Old men, women, the handicapped, and veritable youngsters are being taken into industry. And these people who lack physical adaptability and experienced work-habits of the men who have gone into service, are laboring harder and for longer hours than heretofore. That is a challenging introduction to the present-day industrial hygiene program if ever there was one.

DRAPER, W. F. Government's Obligation in Industrial Health. New Eng. J. Med. 228, 6:178 (Feb. 11), 1943.

**Department of Intimate Confidences**—Knowing next to nothing about psychology it's not for the likes of me to pass judgment, but this paper on current edition parent-child relationships strikes me as so eminently sound that it is commended heartily to you—parent, if you are one. When I reached "never is a parent to strike his child *except* in anger" then I just knew this item must appear. P.S. There are many solid looking papers in the same issue that I didn't read, but you should.

GILDEA, M. C.-L. The Modern American Parent. Ment. Hyg. 27, 1:43 (Jan.), 1943.

**Health Educators Will Agree**—First objective in a national health program is to intensify public health education: this is truer today than ever before. Next in order of importance is nutrition to which is linked child health. The "also ran" activities constitute a long list in this Canadian Health Officer's outline of present-day health administrative problems.

GROULX, A. A National Health Program. Canad. J. Pub. Health 34, 1:10 (Jan.), 1943.

**Despite Theoretical Objections**—Under as nearly identical conditions as could be obtained in industrial practice, one group of workers was given a vitamin-mineral concentrate, a similar group served as a check. The treated group not only had a greater average production than the controls, but more significant, after the second week, there was a steady increase in rate of production among the treated employees. The discussion of the limitations of research of this character should be read by all would-be researchers.

HAGGARD, H. W. Supplementary Feeding in Industry. J. Indust. Hyg. & Toxicol. 24, 10: 332 (Dec.), 1942.

**Arthropod-borne Virus Encephalitides**—Eastern and western equine, and St. Louis type encephalitis should be classified as a group. The place names bear no relation to the limits of these infections. The rôle of mosquitoes as vectors seems to be established. Mosquito bite protection, larva control, and vaccines all may play a part in prevention.

HAMMON, W. McD. Encephalitis. J.A.M.A. 121, 8:560 (Feb. 20), 1943.

**Blissless Ignorance** — Food for health educator's thought: among a group of cancer patients only 26 per cent had read anything really educative about cancer (and that mostly in the newspapers), only 1.2 per cent had seen a cancer pamphlet and heard a lecture on cancer. They waited on the average 3¾ months after the beginning signs before seeking medical help. Conclude the authors: "this educational program is still inadequate and ineffective."

HARMS, C. R., *et al.* Delay in the Treatment of Cancer. J.A.M.A. 121, 5:335 (Jan. 30), 1943.

**Sanitary (?) Bubblers** — A high proportion of drinking fountains now in use would be condemned by any criterion of sanitary decency, and certain types are potentially more dangerous than the old chained tin cup. There's a challenging statement for you, so read all of this brief report.

HITCHENS, A. P., and ROSS, O. A. Bubbling Drinking Fountains. J. Am. Water Works Assn. 35, 2:165 (Feb.), 1943.

**Epidemiologic Study of Venereal Disease Sources**—Evidence to prove what all health workers know to be the case: when prostitution is "regulated" venereal infection rates rise. When it is repressed, they fall. This is an instructive case history of two cities near an army camp.

JOHNSON, B., JR. When Brothels Close, V. D. Rates Go Down. J. Soc. Hyg. 28, 9: 525 (Dec.), 1942.

**How Our Half Lives**—It's about time someone looked into the dietary habits of the favored few. This study of the meals of a considerable group of persons from the upper income level reveals that their diets are markedly deficient in thiamin and riboflavin, only fats were furnished in excess of needs. Milk, eggs, fruit, and whole grain (or enriched) products were frequently found lacking, as they are "on the other side of the tracks." Among the 9 physicians in the group the diets were as bad as the others.

KELLY, H. T., and SHEPPARD, M. A Dietary Study of Subjects from Upper Income Groups. New Eng. J. Med. 228, 4:118 (Jan. 28), 1943.

**Rural Obstetrics**—In that favored region, the first rural area to have a home delivery nursing service, the nurse saw the mother only after the birth certificate was issued in more than half of all cases. This is only one finding of a useful questionnaire study of obstetric care.

O'BRIEN, H. R. Factors in Obstetric Care. New York State J. Med. 43, 3:236 (Feb. 1), 1943.

**U. S. P. H. S. vs. Wartime T. B.**—Chest x-rays of war workers with the service extended to families of those found positive; follow-up of rejected recruits; reorganization of local programs to meet wartime needs—these are some of the promising objectives of the Office of Tuberculosis Control.

PARRAN, T. Tuberculosis Control Program of the U. S. Public Health Service. J.A.M.A. 121, 7:520 (Feb.), 1943.

**Commonest Pneumonia Types**—In a two year nation-wide sampling, three quarters of all pneumococcic pneumonias were found to be due to ten types of pneumococci. This suggests a revision and simplification of current pneumonia typing procedures.

RUMREICH, A. S., *et al.* A Nation-wide Study of the Bacterial Etiology of the Pneumonias. Pub. Health Rep. 58, 4:121 (Jan. 22), 1943.

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SOCIAL WORK YEAR BOOK 1943. By Russell H. Kurtz, Editor. 7th issue. New York: Russell Sage, 1943. 763 pp. Price, $3.25.

FOOD POISONING. By G. M. Dack. Chicago: University of Chicago Press, 1943. 138 pp. Price, $2.00.

EAT WELL FOR LESS MONEY. By Gaynor Maddox. New York: Dutton, 1942. 219 pp. Price, $2.00.

INTENSIVE RURAL HYCIENE WORK IN THE NETHERLANDS EAST INDIES. By J. L. Hydrick. New York: Netherlands Information Bureau, 1942. 83 pp.

ORTHOPEDIC CONDITIONS AT BIRTH. Nursing Responsibilities. Jessie L. Stevenson. New York. Published and Distributed by the Joint Orthopedic Nursing Advisory Service of the National Organization for Public Health Nursing and the National League of Nursing Education.

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HEALTH OF NORTH DAKOTA'S 650,000. Twenty-Seventh Biennial Report, July 1, 1940 to June 30, 1942. 210 pp.

CITY HOUSING CODE. Baltimore City Health Department. 1943. 21 pp.

CANCER: A CHALLENGE TO YOUTH. Study Outline. Mineola: Nassau County Cancer Committee. 16 pp. Paper.

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XIV. The Medical Department in War Industries. Industrial Relations Section, Department of Economics and Social Institutions, Princeton University, Princeton, N. J., 1942.

# ASSOCIATION NEWS

THREE-DAY WARTIME PUBLIC HEALTH CONFERENCE AND

SEVENTY-SECOND ANNUAL BUSINESS MEETING

AMERICAN PUBLIC HEALTH ASSOCIATION

New York, N. Y., October 12, 13, 14, 1943

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

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Lieut. Stephen A. Ginn, M.C., Epidemiological Unit, Naval Operating Base., Norfolk, Va., Medical Officer, U. S. Navy

*Unaffiliated*

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Morton C. Creditor, Biology Dept., Purdue Univ., Lafayette, Ind., Graduate Asst. in Bacteriology

David M. Dorin, Beth Israel Hospital, Stuyvesant Park, East, New York, N. Y., Asst. Director

Major Harold B. Hilton, M.A.C., Headquarters First Air Force, Mitchell Field, N. Y., Administrative Asst. to Surgeon

Gloria A. Kay, 14 Clinton St., Cambridge, Mass., Research Assistant at Thorndike Memorial Laboratories

Albert G. Milbank, LL.B., 15 Broad St., New York, N. Y., President of Milbank Memorial Fund

Frederick A. O. Schwarz, L.L.B., 15 Broad St., New York, N. Y.

Hilda A. Weidner, R. N., 122 N. 18th St., Warwood, Wheeling, W. Va., Charge of First Aid, Wheeling Steel Corp.

**DECEASED MEMBERS**

Richard P. Borden, Fall River, Mass., Elected Member 1920, Unaffiliated

Clarence N. Boynton, Phoenix, Ariz., Elected Member 1916, Elected Fellow 1935, Laboratory Section

Thomas E. Camper, M.D., Corunna, Mich., Elected Member 1936, Health Officers Section

Marvin F. Haygood, M.D., West Point, Ga., Elected Member 1918, Elected Fellow 1938, Health Officers Section

Theodore F. Pappe, Buffalo, N. Y., Elected Member 1940, Food and Nutrition Section

J. F. X. Stack, M.D., Hoboken, N. J., Elected Member 1923, Health Officers Section

Frank A. Williams, M.D., Lake Providence, La., Elected Member 1936, Health Officers Section

# EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y.

## POSITIONS AVAILABLE

U. S. CIVIL SERVICE COMMISSION. Public Health Nursing Consultants, 5 grades. Write U. S. Public Health Service, Washington, D. C.

Physician, man or woman, as director of Division of Maternal, Child and School Hygiene in southern city department of health. Woman physician with pediatric training preferred, public health experience not essential. To operate prenatal, infant and preschool clinics and promote school health program. Salary commensurate with ability and qualifications of applicant. Apply **Box J**, Employment Service, A.P.H.A.

Southern state department of health seeks several obstetric and pediatric consultants, requiring a minimum of a year's residency in a specialty, immunity to draft and preferably training in public health. Men and women are eligible. Salary $300 per month plus travel. Apply **Box C**, Employment Service, A.P.H.A.

### MEDICAL OFFICERS NEEDED—TENNESSEE VALLEY AUTHORITY

The Tennessee Valley Authority is in urgent need of medical officers who are not eligible for military service and who are willing to accept assignments to war industrial activities (construction, manufacture of war chemicals and manufacture of hydroelectric power) as their participation in the all out war effort. Responsibilities include physical examinations, industrial hygiene, care of injuries, medical care to families in remote construction areas and general public health responsibilities in construction camps and villages.

Salary ranges from $3,200 to $4,200 per annum with opportunity for promotion.

For further information write to Dr. E. L. Bishop, Director of Health, Tennessee Valley Authority, Chattanooga, Tenn., or to the Personnel Department, Tennessee Valley Authority, Knoxville, Tenn.

Public Health nurses wanted for two-county unit in Michigan. Must be graduates with a minimum of 4 months' public health training or 8 months' training under supervision. Salary $1,800 per year with travel allowance $35 to $41 per month. Must drive and own a car. Address Dr. Koupal, Director, Alger-Schoolcraft Health Dept., Manistique, Mich.

### CAREER OPPORTUNITIES IN PENNSYLVANIA

Charles B. Frasher, Merit System Supervisor, Pennsylvania State Department of Health, 207 Blackstone Building, Harrisburg, announces that appointments will soon be made in the following branches of the State Health Department of Pennsylvania: Health Conservation, Tuberculosis Control, Venereal Disease Control, Pneumonia Control, Industrial Hygiene, Narcotic Drug Control, Environmental Hygiene, Public Health Laboratories, Maternal and Child Health Services, Crippled Children's Services, School Medical Inspection, Dental, Nutrition, Milk Sanitation, Public Health Education, Sanitary Engineering, Vital Statistics, Public Health Nursing, Accounts, Biologicals and Supplies, Merit System, Tuberculosis Sanatoria. Open competitive examinations will be held and the resulting lists are expected to be in existence for 2 years or longer. Residence requirements are waived for professional positions.

### INDUSTRIAL HYGIENISTS

The Research Section of the Division of Industrial Hygiene, National Institute of Health, Bethesda, Md., needs chemists, physicists, and medical technicians, as well as laboratory assistants in these fields. There is also opportunity for persons without college education, specific training or experience who are interested in such positions. Women now form one-third of the employees in the Research Section.

Wanted: School Dental Supervisor to administer and operate dental program in City schools and clinics in City 50,000 population. Salary $3,000 to $3,600 with travel allowance. Those interested should address Dr. W. A. Browne, City Health Department, Alexandria, Va.

Wanted: Chemist and Bacteriologist experienced in the food field for position

as director of laboratory operated by national association. Preference given to man familiar with soft drink industry and capable of addressing meetings and writing for publication. Apply in writing giving brief history, references, salary, and draft status. Address American Bottlers of Carbonated Beverages, 1128 Sixteenth St., N.W., Washington, D. C.

The Milwaukee City Service Commission announces an examination for assistant chief in charge of sanitary inspection. Salary first year $210 per month increasing by $10 increments annually until a maximum of $260 per month is reached. Applicants must be citizens of the United States, between 25 and 45 years of age. Those interested may communicate with the Milwaukee City Service Commission, Room 716, City Hall, Milwaukee, Wis.

Sanitarian wanted in county of 28,000 in Midwest. Salary $1,800 plus $500 travel. Must own car. Complete supervision and execution of sanitation program, including milk, water, food-handling, etc., and general sanitation of environment in county. Address Box I, Employment Service, A.P.H.A.

Merit System for Personnel Administration, Delaware, is accepting applications for position of Deputy State Health Officer in Delaware State Board of Health. Salary range $3,600 to $4,200. Applications accepted until further notice. Those interested should communicate with Merit System Supervisor, P. O. Box 1911, Wilmington Delaware, or State Board of Health, Dover, Del.

The Board of Health, Territory of Hawaii, announces applications will be received for positions as Medical Technician in their public health laboratories. The positions: Civil Service Classifications, SP-5, salary range $154.17 to $192.92 per month; SP-6, $172.50 to $217.50 per month, subject to retirement deductions under Hawaiian Civil Service System, plus graded bonus for the period of time such bonus remains in effect for Territorial Government employees.

Interested persons may make written application to Board of Health, Territory of Hawaii, P. O. Box 3378, Honolulu, T. H.

**FOR OTHER POSITIONS AVAILABLE WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK, N. Y.**

In view of the current active demand for trained and experienced persons in public health it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y., for up-to-date lists of applicants.

## POSITIONS WANTED

M.D., Dr.P.H., interested mental and industrial hygiene, chief of mental hygiene clinic, on staff of psychiatric hospital, speaker, writer, author of books on health, diplomate in psychiatry, professor of psychiatry. Ineligible for military service because of age, healthy, vigorous, able to work hard, now in private practice; would make sacrifice and accept decent but lower remuneration than present income if he could be employed in war industry, preferably New York, New Jersey, or Connecticut. United States citizen. Had important government job in last war. Speaks and writes several languages. **A-504.**

Milk sanitarian open for position July 1, 1943. Fifteen years' experience administering and enforcing milk sanitation laws and regulations in midwestern state. References. **M-500.**

Bacteriologist, 28, Iowa State College, draft immune, 3 years' experience public health laboratory. Experience in investigation and control activities on water, sewage and sanitation, as chemist and bacteriologist and serologist in syphilis and enteric diseases. **L-465.**

Physician, age 36, M.D. Iowa, Dr.P.H. Harvard, specializing in tuberculosis, seeks position as medical director of a sanatorium or a state bureau of tuberculosis. Exempt from military service. **A-476.**

# NEWS FROM THE FIELD

## The National Resources Planning Board Reports

On March 10, President Roosevelt sent to Congress two reports of the National Resources Planning Board. Long anticipated, they had been referred to variously as "blueprints for the future of democracy," "the American Beveridge plan," and "schemes for the complete socialization of the United States." One document, titled "National Resources Development—Report for 1943," dealt with the Board's work on post-war plans and presented a record of wartime planning activities. Temporary measures for the transition period between the cessation of hostilities and the restoration of a peacetime economy are recommended. Guarantees of jobs for everyone able to work and decent living conditions for everyone are part of the long-range planning for peacetime.

The second report on "Security, Work and Relief Policies" was described by the President in his message of transmission to Congress as having been developed over the last three years by the Board in coöperation with the federal agencies concerned and with the help of citizens with special knowledge and competence in this field. "It reviews," he said, "the accomplishments and experience of the last ten years, pointing out some of the weaknesses of our security system, and suggesting ways and means of improving and strengthening the whole program." He expressed the hope that Congress would give full consideration to these matters during this session.

This report contains specific recommendations based on a comprehensive review of the various public measures taken during the last ten years to provide greater security to the American people. In its introduction, the Board states: "Four main points seem to need emphasis:

> "Our economy must provide work for all who are able and willing to work. Included in this is a special responsibility for an adequate youth program which should be an integral part of any Governmental undertaking to establish security. This will be peculiarly true in the postwar period.
>
> "For great numbers whose work is interrupted, the social insurances must carry much of the load of providing adequate income.
>
> "Where the insurance or work policies fail to take care of an interruption in income, adequate guarantees of minimum aid and assistance must be given both to individuals and families through a general public assistance system.
>
> "Where adequate services essential to the health, education, and welfare of the population are not available, public provision should be made for the development of such services.
>
> "But no one of this series of proposals should be expected to solve the problem of insecurity. Taken together, they constitute a rounded and integrated program. Any one of them standing alone can be criticised as inadequate, and properly so. Unfortunately, complete and well rounded programs seldom are able to be adopted at one time. Living is so complicated and our system so intricate that to change it except step by step may create stresses more serious than the evils the program is designed to correct. The program suggested here is not of that kind. It is all within the realm of practical realization."

Governmental responsibility toward many aspects of living is recognized and clearly stated. A policy of public aid is recommended, based upon acceptance of the facts that the need for public aid will be long and persistent; that maladjustments in the national economy and personal physical or psychological

defects, many of which are remediable, cause the need for public aid, and that social problems created by economic insecurity require a series of diversified programs for their solution.

The specific recommendations for extending the social security program include:

Development of a system of social insurance against temporary and permanent disability.

Expansion of the unemployment compensation system to embrace employees of nonprofit corporations, agricultural and domestic workers, and employees of small firms.

Increase of the benefits period to 26 weeks.

Reconsideration of benefit formulas so that recipients can maintain themselves without recourse to other forms of public aid. Payment of dependents' allowances "might be a first step in this direction."

Abolish experience rating as a part of the unemployment compensation program.

Replace the present federal-state system with a wholly federal system.

Extend old age and survivors insurance to cover employees of nonprofit corporations, agricultural and domestic workers.

Revise financial arrangements to provide that part of the costs of old age and survivors insurance is drawn from the general tax revenues.

Increase benefits payable to the low-income groups under old age and survivors insurance.

Federal grants-in-aid for general public assistance, in addition to adequate work and social-insurance programs, available on a basis reflecting differences in need and economic and fiscal capacity as between the states.

Access to health education and welfare services for everyone, requiring marked expansion of present services, especially in low-income areas, the responsibility for their development to be shared by local, state, and federal authorities.

Administration of public social services by qualified full-time personnel selected on the basis of merit.

More adequate medical care. The federal government "should stimulate, assist or undertake constructive action to provide such care for the millions whose need cannot be fully met from their own resources."

Adequate provisions for promoting the health of mothers and children.

Expansion through federal aid of state and local child welfare services for the prevention of neglect and delinquency so that these services will be "everywhere available."

Provision of free school lunches for all school children.

Extension of the stamp plan for the distribution of surplus commodities to the entire low-income population.

The report is definite with regard to the administration of public aid programs. A single agency should administer all public assistance programs operating in one locality. There should be a central information office in every community to inform applicants for aid of public and private community resources and to direct them to the agency best suited to their needs. The merit system, it states, "should be extended upward, downward and outward for all personnel in the field of public aid." Restrictions on residence in a state or a locality as a condition of employment should be removed. Access to all programs offering employment or training should be through public employment offices.

The Federal Security Agency should be given the status of an executive department and the administrator should be given the status of a member of the Cabinet. The agency should be vested with primary and continuing responsibility for promoting and safeguarding the general welfare, health, and education of the people. The establishment of a permanent national advisory body is recommended to study the over-all operation of public aid policies and programs and advise the President, the Congress, and the country. Similar advisory bodies, representing public and private agencies and the public, should be established at the state level. Public agencies should seek to close the gap between administrators and the public by a continued program of public information, by citizen participation in policy-making, and by "more effective use of the coöperation of private welfare agencies which have a necessary

part to play in this enlarged conception of public welfare service."

Recommendations concerning comprehensive federal work programs are included, as well as programs for youth and for the handicapped. "All youth programs," it is stated, "should devote special attention to the physical health of youth, and financial provision should be made accordingly."

No estimates as to costs of the over-all program and its several parts are attempted in the Board's report, although it suggests that the full cost of the public-assistance program should be borne by the general tax payer and the costs of the social insurance program by the workers, employers, and the general tax payers. The Board warns that because it aimed at developing a well coördinated and consistent body of policies and principles, "no one of its specific recommendations can be considered apart from the whole system of which it is an integral part."

The Chairman of the National Resources Planning Board is Frederic A. Delano.

The report under discussion was prepared by a special committee of the Board under the Chairmanship of William Haber, Professor of Economics, University of Michigan. The agencies, federal and otherwise, represented on the special committee are the Farm Security Administration, Community Chest of Cincinnati, Federal Work Projects, The Catholic University of America, the American Public Welfare Association, the Children's Bureau, and the Federal Security Agency. Eveline M. Burns, Ph.D., was director of research for the study, assisted by Franz Huber, Herman M. Somer, Glen B. McClelland, and a group of economists and research assistants on the staff of the National Resources Planning Board and the various federal agencies concerned with work, security, and relief policies.

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### WAR CONFERENCE

The medical, surgical, and industrial hygiene experts who are so ably safeguarding the well-being of more than 20 million industrial workers have agreed to pool their knowledge and exchange their experiences regarding the many new and complex problems of today's wartime production. For this purpose their organizations—the American Association of Industrial Physicians and Surgeons, the American Industrial Hygiene Association, and the National Conference of Governmental Hygienists—are combining their annual meetings in a four day "War Conference" at Rochester, N. Y., May 24–27, 1943.

This joint meeting will be a report on the state of the nation, by the men who know, in matters of industrial health. Dr. William A. Sawyer, Medical Director of Eastman Kodak, is General Chairman; Dr. James H. Sterner and Lieut. Comm. J. J. Bloomfield are arranging the programs for the industrial hygienists.

### ACTIVITIES OF THE DERMATOSES INVESTIGATION SECTION, U. S. PUBLIC HEALTH SERVICE

The Dermatoses Investigation Section of the National Institute of Health, known as DI, was organized in 1928, under the direction of Louis Schwartz, M.D., medical director, U. S. Public Health Service. The section is concerned with skin disease outbreaks in industry.

Typical of how the DI section operates is the case which arose when an unusual outbreak of skin rash occurred in an eastern war plant. Observers at the plant reported to the DI section's headquarters at the National Institute of Health in Bethesda, Md., that workers making explosives and those filling shell casings were developing a rash on hands, arms, and faces.

DI dermatologists went to the plant and, after a short investigation, found that fumes, generated in the manufacture of TNT, and contact with the powder itself were causing the trouble. With the cause of the outbreaks determined, DI investigators next outlined preventive measures. Detachable sleeves and gloves, that fitted together neatly at the wrists and both made of pliofilm, were developed in the Bethesda laboratory. The flexibility and appearance of this material and its impermeability to the dust, powder, and fumes that were affecting the workers made it the perfect answer.

Safety appliance manufacturers had devised gas masks and work helmets to protect face and head. These sometimes proved awkward and uncomfortable, the doctors reported, and workers discarded them after a few days. Continuing their experiments, the DI researchers produced a pleasant-smelling ointment, for the workers to smear on face and neck, which gave them adequate protection.

An example of the importance of this technical "know-how" is the way DI doctors solved an outbreak of skin trouble among workers in a midwest ordnance plant. The plant reported that men were complaining of skin eruptions on their hands. Plant doctors were puzzled. A DI doctor went to the plant, investigated the manufacturing processes thoroughly, tested all the materials that went into production, all the by-products, all the oils used on machinery and equipment, but he found no clue. Then he examined the workers' clothes and tried to discover some finishing material in their clothing or gloves that might cause the irritation. This line of investigation disclosed nothing. The government dermatologist finally unearthed the fact that the affected workers used a harsh work soap that contained solvents like gasoline and kerosene to remove grease and oil quickly from the skin. Following the DI doctor's advice, the workers stopped using the harsh cleanser and substituted milder ones suggested by the DI doctors. The rashes cleared up in a short time.

Recently a threatened strike in a Seattle shipyard was averted by prompt action on the part of Public Health Service dermatologists. Electricians in one of the city's four shipyards developed a skin eruption which caused considerable alarm. The workers threatened to strike when they learned they were working with cable made by a copper company where occupational hazards resulting in some deaths had recently been reported. Plant officials persuaded the workers to stay on the job until an investigation could be made. Dr. Schwartz flew to Seattle, examined the workers suffering from the "cable rash," and proved immediately that the cause was the chlorinated compound in which the cable was packed. He recommended that the company use a hood respirator to protect the electricians' faces from the chlorine fumes; that the plant should provide clean overalls every day, and that the workers wear long underwear which they should change daily. These precautionary measures were put into practice at once. The strike was avoided and the workers were protected.

### ORGANIZATION OF NATIONAL HEALTH ADVISORY COUNCIL

The Chamber of Commerce of the United States in Washington, D. C., recently announced the formation of a National Health Advisory Council "to project and carry out a broad program looking to health conservation as one of the most important factors in winning the war."

The Council has been organized with James S. McLester, M.D., Professor of Medicine at the University of Alabama, as general chairman. He announced

that the National Health Advisory Council will serve to channel approved technical health information developed by the country's many scientific associations to business organizations and their members throughout the country so that there may be brought about a better public understanding and appreciation of medical science as a means of safeguarding public health to win the war. It will work through the Chamber of Commerce of the United States as a central organization which in turn will use its membership of trade associations, chambers of commerce, and other firms. The Council at the outset is organized with 30 national leaders in medical and health work. It is expected that the membership will be increased.

The Council's first meeting was held in Washington and was presided over by James L. Madden of New York, Vice-President of the Metropolitan Life Insurance Company and Chairman of the National Chamber of Commerce Insurance Department. Participants in the discussion beside Dr. McLester included Wilson G. Smillie, M.D., Cornell University Medical College, New York; Felix J. Underwood, M.D., State Health Officer, Jackson, Miss.; Leverett D. Bristol, M.D., Health Director, American Telephone and Telegraph Company, New York; and H. M. Marvin, M.D., Yale University, New Haven.

Three committees of the Council have been organized under the general chairman which include the following persons:

*Community Committee*, Chairman Wilson G. Smillie, M.D., New York—Paul White, M.D., J. Burns Amberson, M.D., George Kosmak, M.D., George R. Cowgill, Ph.D., Harry Bakwin, M.D., Ernest L. Stebbins, M.D., F. J. Underwood, M.D., Bailey Burritt, Henry F. Vaughan, Dr.P.H.

*Industrial Committee*, Chairman Leverett D. Bristol, M.D., New York—Harvey Bartle, M.D., Philip Drinker, Ph.D., Anthony J. Lanza, M.D., John J. Prendergast, M.D., Loyal A. Shoudy, M.D., W. A. Sawyer, M.D., Harry E. Ungerleider, M.D., John J. Wittmer, M.D., John Dewey Dorsett, and G. W. Hardy.

*Committee on Individual Health*, Chairman James E. Paullin, M.D., Atlanta, Ga.—Leroy U. Gardner, M.D., George Morris Piersol, M.D., Russell Wilder, M.D., Alfred Blalock, M.D., Joseph C. Doane, M.D., Marion G. Howell, R.N., Arthur F. Chace, M.D., H. M. Marvin, M.D., Louis Hamman, M.D., Wallace C. Yater, M.D.

## PUERTO RICO PUBLIC HEALTH ASSOCIATION

The second annual meeting of the Puerto Rico Public Health Association was held in San Juan at the School of Tropical Medicine and Public Health, January 30–31. The well attended meeting was under the Presidency of Major E. Garrido Morales, M.C., U.S.A., and the following officers were elected:

*President*—Pablo Morales Otero, M.D.
*President-Elect*—O. Costra Mandry, M.D.
*Vice-President*—E. Martinez Rivera, M.D.
*Secretary*—G. Arbona, M.D.
*Treasurer*—Celia Guzman
*Representative to the Governing Council*—A. Fernos Isern, M.D.

*Board of Directors:* E. Quintero, M.D., Joseph Dean, M.D., Mary P. de Rahn, Isolina Rivera, R. Fernandez Marchante, M.D.

## NEW GRANTS BY THE NUTRITION FOUNDATION, INC.

George A. Sloan, President of the Nutrition Foundation, New York, announced on March 13 that grants totaling $148,550 for nutrition research during the coming year had been made by the Nutrition Foundation in accordance with recommendations of the Scientific Advisory Committee. Twenty-eight projects supported by the Foundation during 1942 were renewed, with grants totaling $110,700, and fifteen new research projects for a total grant of $37,850 were made. The total in research grants to forty universities since the first grants made one year ago is now $316,000.

Charles Glen King, Ph.D., Scientific Director of the Foundation, described work that is being done under the auspices of the Foundation on amino acids, on the supply of suitable fats to the armed forces in all sections of the world, on nutrition problems relating to aviation and desert warfare, and on the effect of extremes of environment upon nutritional requirements. Dr. King stated that there is close coöperation with the officials in the Quartermaster Corps, the Surgeon General's Office, and the Department of Agriculture.

Institutions which received new grants included the University of Wisconsin, Harvard University, University of Toronto, Columbia University, University of California, Johns Hopkins University, New York University, Massachusetts State College, the University of Chicago, Yale University, Cornell University, Oregon State College and Oklahoma Experiment Station.

V. P. Sydenstricker, M.D., of the University of Georgia Medical School, was appointed a member of the Scientific Advisory Committee of the Foundation. O. C. Carmichael, Chancellor of Vanderbilt University, Nashville, Tenn., and F. G. Boudreau, M.D., of the Milbank Memorial Fund, New York, and Chairman of the Food and Nutrition Board of the National Research Council, were elected public members of the Foundation.

### NEW YORK STATE ADOPTS REGULATIONS FOR HUMAN BLOOD BANKS

The Public Health Council of New York State in February adopted a new chapter of the State Sanitary Code, Chapter IV-A, which is believed to be the first regulatory action taken by a state body in the field covering human blood donors, human whole blood, human plasma, human serum or other human blood derivatives used for transfusion purposes.

The requirements prescribed are designed to meet the need for basic standards to insure the safety of human blood products. Possible dangers from the use of improperly prepared or stored human blood products for transfusion purposes were first discussed by the Council in 1941. As processing practices became more stable and it appeared that the establishment of blood plasma banks would become widespread and might include many small institutions lacking adequate equipment and qualified personnel, regulatory action was deemed desirable. The amendment has been designed to care not only for changes affecting the technical aspects of preparation of blood, but also certain over-all factors as a determination to distinguish between the requirements for commercial laboratories and other laboratories or hospitals and to regulate by requiring careful recording of basic information instead of listing certain specific requirements as to how the blood should be collected, processed, stored, and used. The purpose of the latter decision is to promote progress in the development of blood processing while fixing responsibility for the procedure on the part of the laboratory or institution.

### INSTITUTE ON PUBLIC HEALTH ECONOMICS, UNIVERSITY OF MICHIGAN

A two weeks' Institute for training in the organization and management of prepayment plans of various types will open May 10, 1943, at the School of Public Health, Ann Arbor, Mich. The school is able to offer this course through a grant from the Rockefeller Foundation, made through the Committee on Research in Medical Economics, and with the aid of an Advisory Committee representing hospital, medical, coöperative, rural, and other types of health service plans. Students may

live on the campus at moderate rates. The university charges a registration fee of $5.

The Institute is designed to meet the needs of two groups of students: (1) those already working with a prepayment plan or having a specialized interest in this field of administration; (2) those who are concerned with public health, hospital administration, or other community services and who feel it wise to learn about the growing field of health service plans. In the program of instruction, much stress will be laid on discussion. The subjects covered will include (a) the basic facts of the economic and social aspects of health services as they involve population, professions, and institutions; (b) plans of organized care of various types, their development, problems, and current issues; (c) special topics relating to the organization and administration of health service plans, *e.g.*, an intensive series on methods of appraising community medical facilities and needs, especially designed for public health people, and several technical series on management problems, statistics, and accounting connected with prepayment plans.

The instructing staff will include several members of the university faculty, all the members of the Advisory Committee, and a number of other persons concerned with the organization and management of prepayment plans and with related problems of industry, labor, governmental, and professional bodies.

The Advisory Committee includes:

Michael M. Davis, Ph.D., Chairman, Committee on Research in Medical Economics, New York
Dean A. Clark, M.D., U. S. Public Health Service, Washington
Franz Goldmann, M.D., School of Public Health, Yale University, New Haven
A. E. Larsen, M.D., California Physicians' Service, San Francisco
John R. Mannix, Michigan Hospital Service, Detroit
James C. McCann, M.D., Massachusetts Medical Service, Boston
Fred R. Mott, M.D., Farm Security Administration, Washington
Kingsley Roberts, M.D., Medical Administration Service, New York
C. Rufus Rorem, Ph.D., C.P.A., Hospital Service Plan Commission, Chicago
Henry E. Sigerist, M.D., Johns Hopkins Institute for the History of Medicine, Baltimore
E. A. Van Steenwyk, Associated Hospital Service, Philadelphia

Individuals interested in this course, and agencies which might send staff members, can obtain full information about requirements for admission, the curriculum, expenses, etc., by communicating with: Professor Nathan Sinai, Dr.P.H., The School of Public Health, University of Michigan, Ann Arbor, Mich.

### NEW CHAIRMAN O.D.H.W.S. COMMITTEE ON NURSING

James A. Crabtree, M.D., the Executive Secretary, Health and Medical Committee, Office of Defense Health and Welfare Services, has announced the appointment of Marion W. Sheahan, R.N., of Albany, N. Y., Director of the Division of Public Health Nursing, New York State Department of Health, as Chairman of the Subcommittee on Nursing of the Health and Medical Committee. This subcommittee was organized in November, 1940, by the Health and Medical Committee, which in turn was set up by executive order of the President in September, 1940. Its purpose is to make over-all studies of nursing needs and to recommend methods of meeting them, as well as to coördinate all stages of the nation's wartime nursing problems. Miss Sheahan is first Vice-President of the N.O.P.H.N. and a member of the Board of Directors of the National Nursing Council for War Services. She succeeds Marion G. Howell, R.N., of Cleveland.

## REPORT ON BUTTER SUBSTITUTES BY THE NEW YORK ACADEMY OF MEDICINE

The exigencies of war have created shortages in the availability of certain staple foods, butter among others. The Committee on Public Health Relations of the New York Academy of Medicine has been requested to report on oleomargarine—the present status of its production and of its adequacy as a partial replacement for butter during the present crisis.

The use of oleomargarine in this country goes back for well over half a century. Congress enacted legislation bearing on the subject as far back as 1886, two decades prior to the first Food and Drug Act. The original oleomargarine act was of a purely economic and fiscal nature. Under this act each package must be properly labeled with the word "oleomargarine" in letters three-quarters of an inch high, and the Bureau of Internal Revenue is authorized to levy an excise tax on every merchant selling the product. Every state (particularly the dairy states) has added restrictive provisions of one kind or another, such as taxes ranging from 5 to 15 cents a pound and license fees for manufacturers and venders, and in some instances licenses are necessary for restaurants, hotels and boarding houses serving margarine to their patrons. In half of the states, and this includes New York, oleomargarine cannot be served in institutions receiving tax support or subsidies. Retail license fees, state and federal taxes, state restrictions on the types of fats that may be used, and numerous interstate trade barriers have restricted its sale so that margarine is not sold in two-thirds of the retail food stores of the nation and is not available at all in some states. In many states the sale of yellow margarine is prohibited because of its resemblance to butter. The U. S. Census of Manufacturers of 1939 reports a considerable decline in the output of margarine. This decline applied to all types of magarine whether made solely of vegetable oils or of mixtures of animal and vegetable oils and fats. As of January 1, 1943, however, by order of the War Production Board, margarine manufacturers who previously were allowed to use only 110 per cent of their average consumption of fats and oils in 1940 and 1941, were permitted to raise that figure to 180 per cent.

There has been a great deal of misinformation concerning the product. The motivation has been on purely economic grounds. We have looked into the matter solely from a nutritional and social viewpoint without regard to the economic aspects of the situation.

### *Definition and Standard of Identity*

In June, 1941, the Federal Security Administrator, after a hearing in the matter, promulgated regulations fixing and establishing a definition and standard of identity for oleomargarine which in substance is as follows: Oleomargarine is a food, plastic in form, which consists of one or more of the various specified rendered fats, or of vegetable fats, or of a combination of animal and vegetable fats, mixed with milk or cream. In the preparation of oleomargarine one or more of the following optional ingredients may also be used:

1. Artificial coloring.

2. Sodium benzoate, or benzoic acid, or a combination of these, in a quantity not to exceed 0.1 per cent of the weight of the finished product.

3. Vitamin A, added as fish liver oil or as a concentrate of vitamin A from fish liver oil (with any accompanying vitamin D and with or without added vitamin D concentrate), in such quantity that the finished oleomargarine contains not less than 9,000 United States Pharmacopoeia Units of vitamin A per pound.

4. The artificial flavoring diacetyl added as such, or as starter distillate, or

produced during the preparation of the product as a result of the addition of citric acid or harmless citrates.

5. (a) Lecithin, in an amount not exceeding 0.5 per cent of the weight of the finished oleomargarine; or (b) monoglycerides or diglycerides of fat-forming fatty acids, or a combination of these, in an amount not exceeding 0.5 per cent of the weight of the finished oleomargarine; or (c) such monoglycerides and diglycerides in combination with the sodium sulfo-acetate derivatives thereof in a total amount not exceeding 0.5 per cent of the weight of the finished oleomargarine; or (d) a combination of (a) and (b) in which the amount of neither exceeds that above stated; or (e) a combination of (a) and (c) in a total amount not exceeding 0.5 per cent of the weight of the finished oleomargarine. (The weight of diglycerides in each of ingredients (b), (c), (d), and (e) is calculated at one-half actual weight.)

6. Butter.

7. Salt.

Most manufacturers use vegetable fats, particularly coconut, peanut, and cottonseed oils, in preference to animal fats or oils because these ingredients have less tendency toward rancidity, and they have taken advantage of the regulation permitting the addition to the product of 9,000 units of vitamin A per pound.

From a nutritional viewpoint, when it is fortified with vitamin A in the required amount, oleomargarine is the equal of butter, containing the same amounts of protein, fat, carbohydrates, and calories per unit of weight. Moreover, since the minimum vitamin A content of "enriched" oleomargarine is fixed and the amount of this vitamin in butter may range from 500 to 20,000 units per pound, "enriched" oleomargarine is a more dependable source of vitamin A than is butter. Since it is a cheaper product than butter, fortified oleomargarine constitutes a good vehicle for the distribution of vitamin A and fats to low-income groups and should therefore be made available to them.

Under the standards set by the Food and Drug Administration, oleomargarine is as clean and sanitary a food as butter. The two products are likewise equal in digestibility. Their relative palatability is a matter of individual taste.

*Conclusions and Recommendations*

In order that the health of the population may not be impaired by the adoption of a diet insufficient in fats and fat soluble vitamins, the committee recommends that the manufacture, distribution, and consumption of oleomargarine be encouraged and suggests specifically:

1. That the regulations set by the Federal Security Administrator in 1941 be amended to make it mandatory that all oleomargarines be fortified with vitamin A at a uniform level of 9,000 United States Pharmacopoeia Units per pound of finished product;

2. That the War Production Board be requested to allow the use of fats and oils for the manufacture of oleomargarine in such quantities as would offset the necessary withdrawal of butter from civilian use;

3. That federal and state laws which restrict the manufacture and distribution of oleomargarine be suspended for the duration of the butter crisis;

4. That wide publicity, both lay and professional, be given the fact that oleomargarine, fortified by vitamin A, is nutritionally equal to butter; and

5. That this matter be brought to the attention of the President of the United States, the Secretary of Agriculture of the United States and his Technical Assistant on Civilian Requirements, and the Commissioner of Agriculture and Markets of New York State.

## CINCHONA FELLOWSHIPS

The Cinchona Products Institute of New York has announced that two

Fellowships are offered for clinical or pharmocological research on quinine or the other alkaloids of cinchona. The Fellowships carry a yearly stipend of $2,000, plus necessary laboratory or routine expenses. Further details may be secured from the Institute, 10 Rockefeller Plaza, New York, N. Y.

### GALLUP POLL TESTS WARTIME EATING HABITS

In order to discover how much the average American adult knows about simple nutrition rules and where an educational program may be needed, the American Institute of Public Opinion recently conducted a nation-wide survey in which a record of the principal foods consumed by representative adults in all states was obtained for a 24 hour period. Results were compared with a list of essential foods recommended by the Bureau of Home Economics of the Agriculture Department and other nutrition experts.

The comparison is shown below. The figures represent the number of persons who ate none at all of the foods listed as necessary daily in each category:

| *Food Recommendations* | *How Adult Americans Live Up to Them* |
|---|---|
| Fruits and Raw Greens: tomatoes, citrus fruits or juices, raw cabbage, or salad greens | 45% had none |
| Eggs: 1 a day | 48% had none |
| Milk and/or Cheese | 34% had none |
| Vegetables: leafy green or yellow | 25% had none |
| Meats: meat, fish, or poultry | 12% had none |
| Other Vegetables (including potatoes) or Fruit | 8% had none |
| Cereals or Bread: whole grain or enriched | 3% had none |

"The greatest deficiencies in the national diet are apparently the citrus fruits and raw greens, eggs, and dairy products. Although health authorities recommend one pint of milk a day for adults (one quart for children), more than one-third of all adults in the survey consumed no milk or ate no cheese. Taking milk alone, the survey found that 43 per cent had consumed none, while 57 per cent included at least some milk in their diet.

"While the Bureau of Home Economics recommends that the foods listed in the table above be eaten every day, it does allow some latitude in consumption of eggs, considering three or four a week sufficient. Although 48 per cent in the survey said they had no eggs, some may have overlooked eggs used in cooking.

"The campaign of health authorities to induce people to eat more leafy green and yellow vegetables is apparently making progress. Three-fourths of all persons in the survey lived up to the rule. The proportion is likewise high for consumption of potatoes, other vegetables (beets, cauliflower, corn, cucumbers, onions, turnips, etc.), and other fruits (apples, bananas, berries, melons, prunes, etc.). That Americans are a nation of meat eaters is likewise shown by the fact that only 12 per cent had no meat, fish or poultry.

"Sharp differences in dietary habits were found by income groups. In the lower group the outstanding deficiencies, as compared to other income groups, were citrus fruits and raw greens; eggs; milk; and leafy green or yellow vegetables.

PERCENTAGE LACKING FOOD REQUIREMENTS

| | *Upper Income* | *Middle Income* | *Lower Income* |
|---|---|---|---|
| Citrus Fruits & Greens | 24% | 35% | 56% |
| Eggs | 45 | 43 | 52 |
| Milk, Cheese | 27 | 26 | 40 |
| Vegetables (leafy and yellow) | 19 | 21 | 29 |
| Meats, Fish, Poultry | 7 | 8 | 15 |
| Other Vegetables | 6 | 6 | 10 |
| Cereals or Bread | 3 | 2 | 3 |

"Among geographical sections, the South shows a greater deficiency than any other section in citrus fruits and raw greens, while the New England and

Middle Atlantic area shows greatest deficiency in milk or milk products."

NATIONAL DIET PICTURE BY SECTIONS

*Percentage Lacking Food Requirements*

| | *N. Eng. and M. Atl.* | *East Cent.* | *West Cent.* | *South* | *Far West* |
|---|---|---|---|---|---|
| Citrus Fruits and Greens | 46% | 41% | 43% | 53% | 41% |
| Eggs | 53 | 51 | 49 | 41 | 46 |
| Milk, Cheese | 43 | 31 | 31 | 31 | 28 |
| Vegetables (leafy and yellow) | 28 | 26 | 25 | 21 | 24 |
| Meats, Fish, Poultry | 9 | 12 | 12 | 14 | 14 |
| Other Vegetables | 8 | 8 | 5 | 12 | 7 |
| Cereals or Bread | 3 | 4 | 2 | 3 | 3 |

REPORT ON SCHOOL HEALTH

A report of the Committee on School Health of the American Academy of Pediatrics, published in the February 20 issue of the *Journal of the American Medical Association,* will have special interest for members of the Maternal and Child Health, the School Health and the Health Education Sections. It proposes a plan of administration through which the professions of education and medicine might work together to educate parents and children to use curative and preventive medicine intelligently. The report includes proposed professional qualifications for medical personnel in the schools. Reprints may be secured from Dr. Clifford G. Grulee, American Academy of Pediatrics, 636 Church Street, Evanston, Ill.

NEWS OF THE O.C.D. MEDICAL DIVISION

Dr. George Baehr, Chief Medical Officer of the Office of Civilian Defense, Washington, has spent two weeks recently in Hawaii at the invitation of the Governor of the Territory and in conference with local authorities on civilian defense activities, which are being reorganized now that the government of the Island is in the process of being transferred from the Army to civil authority.

Dr. Hamilton Southworth of the staff of the Medical Division, O.C.D., has gone to London, England, as a medical liaison officer with the British Office of Home Security.

James M. Landis, the U. S. Director of Civilian Defense, has announced that arrangements have been made for the Civil Air Patrol to fly blood plasma supplies into stricken areas in the event of emergencies.

Dr. Dudley A. Reekie, Boston, Regional Medical Director of the First Civilian Defense Region, has been serving as Chief of the Field Casualty Section of the Medical Division in the absence of Dr. Leonard A. Scheele, who is assigned to special duty.

HEBREW UNIVERSITY WANTS JOURNALS

The Hebrew University Library of Jerusalem is seeking to obtain back numbers of the AMERICAN JOURNAL OF PUBLIC HEALTH in order to complete its files. Will any person having such back numbers or complete volumes who wishes to donate them to the Hebrew University, please communicate with Jerome Trichter, Bureau of Food and Drugs, 125 Worth Street, New York, N. Y. The following are the numbers desired.

| | |
|---|---|
| Volume 1 to 8 | (1911–1918)—All numbers |
| 9 | (1919)—No. 2 to No. 12 |
| 10 | (1920)—All numbers |
| 18 | (1928)—No. 8 |
| 20 | (1930)—No. 1 |
| 22 | (1932)—No. 3 and No. 4 |
| 23 | (1933)—No. 2, No. 4, No. 6 to No. 12 |
| 24 | (1934)—No. 9 |
| 25 | (1935)—No. 6, No. 9, No. 11 and No. 12 |

All arrangements for shipping the donated material and costs will be taken care of by Mr. Trichter.

# PERSONALS

## Central States

FRED P. BESTGEN, M.D.,† formerly of Rapid City, S. D., has been appointed Director of the Hall-Adams Health Unit, Nebraska.

G. C. BROWN, M.D., of Newton, Ill., has joined the Peoria City Department of Health as Clinic Physician for the Well Baby Clinic, Maternity Centre, and the school clinics.

CONRAD A. ELVEHJEM, PH.D.,† Professor of Biochemistry, University of Wisconsin, Madison, has been awarded the Willard Gibbs Medal by the Chicago Section of the American Chemical Society. It will be presented formally to Dr. Elvehjem May 20.

CORNELIUS A. HARPER, M.D.,* of Madison, retired on January 28 as State Health Officer, a position he has held since April 1, 1904. He has been a member of the Board since February, 1901. CARL N. NEUPERT, M.D., of Madison, who has been Assistant State Health Officer for 6 years, has been named Secretary to the Board of Health and State Health Officer. DR. Harper has been named Medical Specialist in Public Health to the State Board.

VIRGINIA B. HICKERSON, M.D., has been appointed Pediatrics Coördinator for the Anti-Tuberculosis League of Cincinnati and Hamilton County, Ohio, succeeding BARBARA A. HEWELL, M.D.

EDWIN HALL JORRIS, M.D.,† of Madison, Supervisor of Local Health Services and Director of the Division of Tuberculosis Control of the Wisconsin State Board of Health, has been commissioned a lieutenant commander in the medical corps of the U. S. Naval Reserve.

PROFESSOR MAX LEVINE,* of the Department of Bacteriology, Iowa State College of Agriculture and Mechanic Arts, at Ames, is serving with the Sanitary Corps, having recently been promoted to the rank of Lieutenant Colonel. At present he is in the Brooke General Hospital, Fort Sam Houston, Texas. Three of Dr. Levine's sons are serving in the Army: Lt. Norman D. Levine, Sanitary Corps; Lt. S. Edgar Levine, Engineer Corps; and Lt. Melvin L. Levine, Field Artillery.

STEPHEN V. LUDDY, D.D.S., M.P.H.,† Director of Oral Hygiene in the North Dakota State Department of Health, Bismarck, N. D., resigned January 1, 1943, to accept a position as Director of the Bureau of Dental Health of the West Virginia State Health Department, Charleston, W. Va.

KARL M. MASON has resigned from the staff of the Department of Health of Ingham County, Mich., to accept the position of Public Health Engineer with the Division of Sanitation, of the Peoria, Ill., Department of Health, effective February 15.

HAZELETT A. MOORE, M.D., of Oxford, Ohio, Chairman of the Butler County Board of Health since 1939, has been appointed Health Commissioner of Butler County, succeeding CLIFFORD J. BALDRIDGE, M.D.,† resigned.

JOSEPH B. STOCKTON, M.D., of Cleveland, Ohio, Medical Director of the Cuyahoga County Tuberculosis Dispensary, has been appointed Controller of Tuberculosis for Cuyahoga County.

BUELL H. VAN LEUVEN, M.D.,† of Traverse City, Mich., has been appointed in charge of the new district health unit recently formed when

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* Fellow A.P.H.A.
† Member A.P.H.A.

Leelanau County joined with the Grand Traverse County Department of Health, which has functioned since April, 1939.

JAMES F. WILSON, M.D.,† of Washington Court House, Ohio, until recently Health Commissioner of Fayette County and Secretary for many years of the Fayette County Medical Society, has been appointed Health Commissioner of District No. 4 of the Michigan Department of Health, with headquarters in Rogers City, Mich.

ANDREW C. WOOFTER, M.D., of Hot Springs, Ia., has been assigned to Iowa by the U. S. Public Health Service to direct the state's venereal disease program during the war period. He succeeds REGNAR M. SORENSON, M.D., C.P.H.,* who is now on active duty with the Reserve Corps of the U. S. Public Health Service at the Iowa State Board of Health, Topeka.

### Eastern States

GERTRUDE E. HODGMAN, R.N., who for 2 years has been Director of the Russell Sage College School of Nursing, Troy, N. Y., has been appointed by the Coördinator of Inter-American Affairs as Director of Nurses' Training in the Ministry of Health and Education of Brazil. She will assume the new post in June. Miss Hodgman will be succeeded at Troy by KATHARINE G. AMBERSON, who has been Director of Clinical Nursing Education.

ELLEN C. POTTER, M.D.,* of Trenton, N. J., has been appointed as Director of Medicine and Chairman of the Child Care Committee of the Office of Civilian Defense Director of the State of New Jersey.

MRS. MAX J. H. ROSSBACH is the new Director of Child Care for the American Women's Voluntary Services in New York, N. Y.

### Southern States

GEORGE M. COOPER, M.D.,† of Raleigh, has been named President of the North Carolina Academy of Public Health recently organized by the North Carolina State Laboratory of Hygiene, Raleigh, N. C. Dr. Cooper is Assistant State Health Officer and Director of the Division of Health Education, Crippled Children's Work, and Maternal and Child Health Service.

MARIE ELIZABETH F. GENTRY, M.D.,† was recently named Director of the Maternal and Child Health Division of the Austin [Texas] City Health Department, succeeding WILLIAM W. KELTON, JR., M.D.,† who has entered the Army Air Corps.

J. LEE HARWELL, M.D., of Poplar Bluff, Mo., was appointed to the City Board of Health on December 30.

RAYMOND HUSSEY, M.D., Associate Professor of Medicine, Johns Hopkins University School of Medicine, Baltimore, Md., and a member of the Council on Industrial Health, American Medical Association, Chicago, Ill., has been appointed Scientific Director of the new Army Industrial Hygiene Laboratory at Johns Hopkins University School of Hygiene and Public Health. The Laboratory will operate under the direction of the Occupational Hygiene Branch of the Preventive Medicine Division of the Office of the Surgeon General of the Army.

ROY A. KELLY, M.D., of New Roads, La., Director of the St. Charles Parish Health Unit, was recently assigned in charge of the Jefferson Davis Health Unit.

WILLIAM C. D. MCCUSKEY, M.D.,† of Wheeling, W. Va., has been appointed a member of the Public Health Council for the term ending June 30,

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* Fellow A.P.H.A.
† Member A.P.H.A.

1945, succeeding ALBERT H. HOGE, M.D., of Bluefield, Md.

ABRAHAM OPPENHEIM, M.D.,† of Arcadia, La., Director of the Bienville Parish Health Unit, has been appointed in charge of the units in Vermillion and New Iberia Parishes.

RUTH G. TAYLOR, M.A., R.N.,† of Washington, D. C., has been appointed Director of the Nursing Unit of the Division of Health Services, U. S. Children's Bureau, Department of Labor, Washington, succeeding NAOMI DEUTSCH, R.N.,* resigned. Miss Taylor has recently been a member of the staff of the International Health Division, Rockefeller Foundation, and has been stationed in Europe. Previously she was Public Health Nursing Consultant of the Children's Bureau, stationed in San Francisco.

### Western States

JOHN HALL * has left the Clark County Department of Health, Las Vegas, Nev., to join the Territorial Health Department, Juneau, Alaska.

ANDREW M. HARVEY, M.D., has been appointed Assistant City Health Officer of Long Beach, Calif. He succeeds FREDERICK G. HALL, M.D., who had been Acting Assistant Health Officer under FRANK W. STEWART, M.D.,† but who has retired.

F. RUTH KAHL, R.N.,* who has been Public Health Nursing Consultant in U. S. Public Health Service District No. 8, with headquarters in Denver, has been assigned as Nursing Consultant with the Division of Industrial Hygiene, National Institute of Health, Bethesda, Md., beginning in January.

JOHN A. KAHL, M.D., M.P.H.,† District Health Officer with headquarters at Walla Walla, Wash., has resigned to become Assistant Director of Health of Washington. The district of which he has been head includes Walla Walla, Benton, and Franklin Counties. At one time Dr. Kahl had served as Director of Local Health for the State Department of Health and as Health Officer of Clark County.

FREDERICK M. PETRIE, M.D., has been appointed Health Officer of Toppenish, Wash., succeeding ANGUS MEAGHER, M.D., who has gone into military service.

### DEATH

DR. JOSEPH F. X. STACK, Health Commissioner of Hoboken, N. J., since 1911, died February 17, at the age of 72.

* Fellow A.P.H.A.
† Member A.P.H.A.

## CONFERENCES AND DATES

American Association of Industrial Physicians and Surgeons. Hotels Seneca, Sagamore, and Rochester, Rochester, N. Y., May 24–27.

American Association of Social Workers. Cleveland, Ohio. May 22–23.

American Industrial Hygiene Association. Hotels Seneca, Sagamore, and Rochester, Rochester, N. Y., May 24–27.

**American Public Health Association—Wartime Public Health Conference and 72nd Annual Business Meeting. New York, N. Y. October 12–14.**

American Society of Planning Officials. Joint Meeting of National Conference on Planning and American Institute of Planners. New York, N. Y. Week of May 17.

American Water Works Association—
- Canadian Section—Royal Connaught Hotel, Hamilton, Ontario, Can. April 7–9.
- Illinois Section—Springfield, Ill. April 8–9.
- Ohio Section — Mansfield-Leland Hotel, Mansfield, Ohio. April 12.
- Pacific Northwest Section — Bellingham, Wash. May 7–8.
- Montana Section — Billings, Mont. May 14–15.
- Conference on War Winning Water Works Operations. Carter and Statler Hotels (co-headquarters), Cleveland, Ohio. June 15–18.

Association of Food and Drug Officials of the United States—47th Annual Conference. Cosmopolitan Hotel, Denver, Colo. May 25–28.